Make shipping more sustainable

27th of September
Giorgio Fabbi

Port and Shipping Tech Conference Naples

Agenda

- AkzoNobel and the future of sustainable shipping
- SulpherCap 2020 & solution from a paint supplier
- Scrubber – quick overview of the issues for the hull & tanks anticorrosive protection

Sustainable business focus areas

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Raw Materials and Products

Reduce eco-footprint in manufacturing, raw material seletion and product use

SSI2040

Bringing together leading companies in the maritime sector to create a sustainable and successful shipping industry by 2040

The Ocean Cleanup

Develops advanced technologies to rid the world's oceans of plastic. A full-scale deployment of our systems is estimated to clean up 50 % of the Great Pacific Garbage Patch in 5 years

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UV Led light Technology

- AkzoNobel and Royal Philips are combining their expertise to develop a revolutionary fouling prevention technology which uses ultraviolet light emitting diodes (UV-LED).
- Replacing the traditional anti-fouling coating, the new innovation uses UV-LED lights to prevent all fouling growth including biofilms.
- The new digital innovation is fully biocide-free, and provides groundbreaking performance by affording complete fouling prevention to ship and boat hulls.

Sulphur Cap 2020

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Who is going to pay the bill?

The IMO fuel sulphur regulation: global cap

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- The IMO Marpol Annex VI regulation on limiting sulphur content of bunker fuel to a maximum of 0.5% will enter into force. At present (since 2012), the global sulphur content cap on bunker fuel is at 3.5%, a level considered easy to comply with for vessel operators
- The IMO Marpol Annex VI 'Prevention of Air Pollution from Ships', first adopted in 1997 and came into force in 2005, has established limits on sulphur content in bunker fuel, as well as the creation of ECAs in designated sea areas setting stricter sulphur content limits at just 0.1%
- Marpol Annex VI started with a global sulphur cap of 4.5% before it was lowered to 3.5% in 2012. The steep reduction to a global 0.5% sulphur cap by 2020 was decided in October 2016 by the IMO Marine Environment Protection Committee (MEPC)
- The IMO had commissioned a review to assess whether sufficient compliant fuel oil would be available to meet the 2020 date, and this review/study was carried out by independent research and consultancy organisation CE Delft. This study was then submitted to IMO member states to help them in their deliberations
- Going forward, MEPC will look into approving a new output on consistent implementation of the sulphur regulation of Marpol Annex VI. The scope of the work, to be completed during two sessions of the Sub-Committee on Pollution Prevention and Response, during 2018 and 2019, could include considering a number of preparatory and transitional issues surrounding the shift to the new 0.5% limit from 2020

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Source: Seatrade Maritime News

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Options for Ship Owners

Solution	Method	Pros	Cons	Likelihood
Do Nothing i.e. switch to distillate fuel in 2020	• Lower fuel sulphur content (including blended fuel)	• Safe • Proven • Limited technology investment needed	• Higher fuel cost • Fuel availability uncertain	• Considered to be the most likely option for majority of vessels
Alternative Fuels e.g. LNG	• Switch to using less polluting fuels	• LNG: very low NOx, SOx and PM • c.20% reduction in CO_2 emissions • Cost competitive fuel	• Retrofit complex and expensive • Technology is costly • Fuel availability uncertain - bunkering infrastructure limited • Cargo capacity	• Retrofits of existing ships unlikely • Approaching 10% of orderbook with LNG as fuel • Mainly LNG carriers/ Ferries/ Cruise – uptake likely to be much slower in volume sectors • Certain owners looking at other fuels including LPG
Exhaust Gas Cleaning Systems /SOx Scrubbers	• Open Loop: exhaust gases mix with seawater, forms sulphuric acid which is then neutralised by the alkaline components in seawater and discharged overboard • Closed Loop: gases are cleaned with seawater mixed with caustic soda. • Hybrid: capable of using both methods.	• SOx emissions reduced by more than 90% • PM emissions reduced by 60-90% • Enables continued use of cheaper HFO	• Significant investment/ payback period • Additional operational costs associated with catalyst, increased power and disposal of sludge • Issues with wash water discharge • Long term availability of low cost HFO	• Some uptake in orderbook but many owners unlikely to make CAPEX commitment (at least pre-2020).

Observation/Opinion:

- The world's three leading oil majors – BP, Exxon and shell have not mentioned anything on a mass production of 0.5% blends* [Perspective in 2017]
- Global bunker demand is 275 to 325 mt per annum
- Value of 90 to 120 bn. per year

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* Seatrade Maritime News

How can a paint supplier be a partner during these changes: products

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- OPEX increase means that the requirement of operational efficiency improvement will increase
- Premium level of anti-fouling system demand will increase:
  - Intercept® Linear Polishing Polymer (LPP) biocidal antifoulings
    - unique and revolutionary coatings featuring patented *Lubyon*® technology
  - Intersleek 1100SR: foul release fluoropolymer **100% biocide free, ready for any future legislation about heavy metals and biocide contained in the antifouling and modified silicones**

Not only the hull:

- Interline 9001 – To increase tank cleaning efficiency (Cleaning efficiency improvement)

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Intercept®8500 LPP (2015)

- Lubyon® technology combined with a silyl methacrylate Self-Polishing Copolymer and optimised biocide package
- Combination of linear polishing of Lubyon® polymer with faster polishing of silyl methacrylate
- Optimized biocide package of copper oxide and copper pyrithione delivers higher performance fouling control in a controlled and consistent linear manner
- Highest performing of our deep sea biocidal products, particularly suitable for high fouling challenge routes such as Arabian Gulf to South East Asia

Intersleek 1100 fluoropolymer

AkzoNobel

Zero Biocides

- Elimination of biocides **prevents the release of chemicals** into the marine environment

- Fluoroplymer foul released: more than 10 years experience, 100% biocide free: ready for any future legislation
- 10 (ten) years in service with just repair at intermediate DD (depending in dock conditions)
- Do not change chemical status during in service: very low and constant surface roughness
- In case of cleaning there will be not biocide release in the water and or in dock during washing
- Mixed scheme is available: meaning boottop or fender areas with less expensive silicone or antifouling

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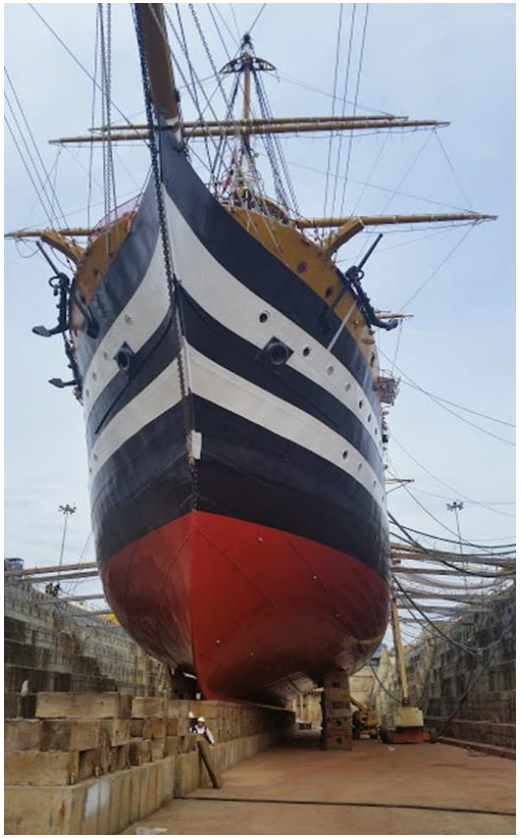
Intersleek 1100 fluoropolymer



FREMM frigates: all coated with Intersleek fluoropolymer biocide free: after three years, just washing

How can a paint supplier be a partner during these changes: services: Intertract Management Services

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- **Optimum hull performance**
  - Reduced/predictable fuel consumption
  - Happy charterer
  - Competitive edge
  - Reduced emissions
  - Reduced internal costs
- **Engaged hull performance partner**
  - True hull performance guarantee
  - Spread of hull performance risk
  - Joint hull performance analysis, Early diagnosis of any issues
  - Joint quality control of hull inspection/maintenance
  - Increased focus on hull condition/care
- **Pay as hull performs**
  - Improved cash flow

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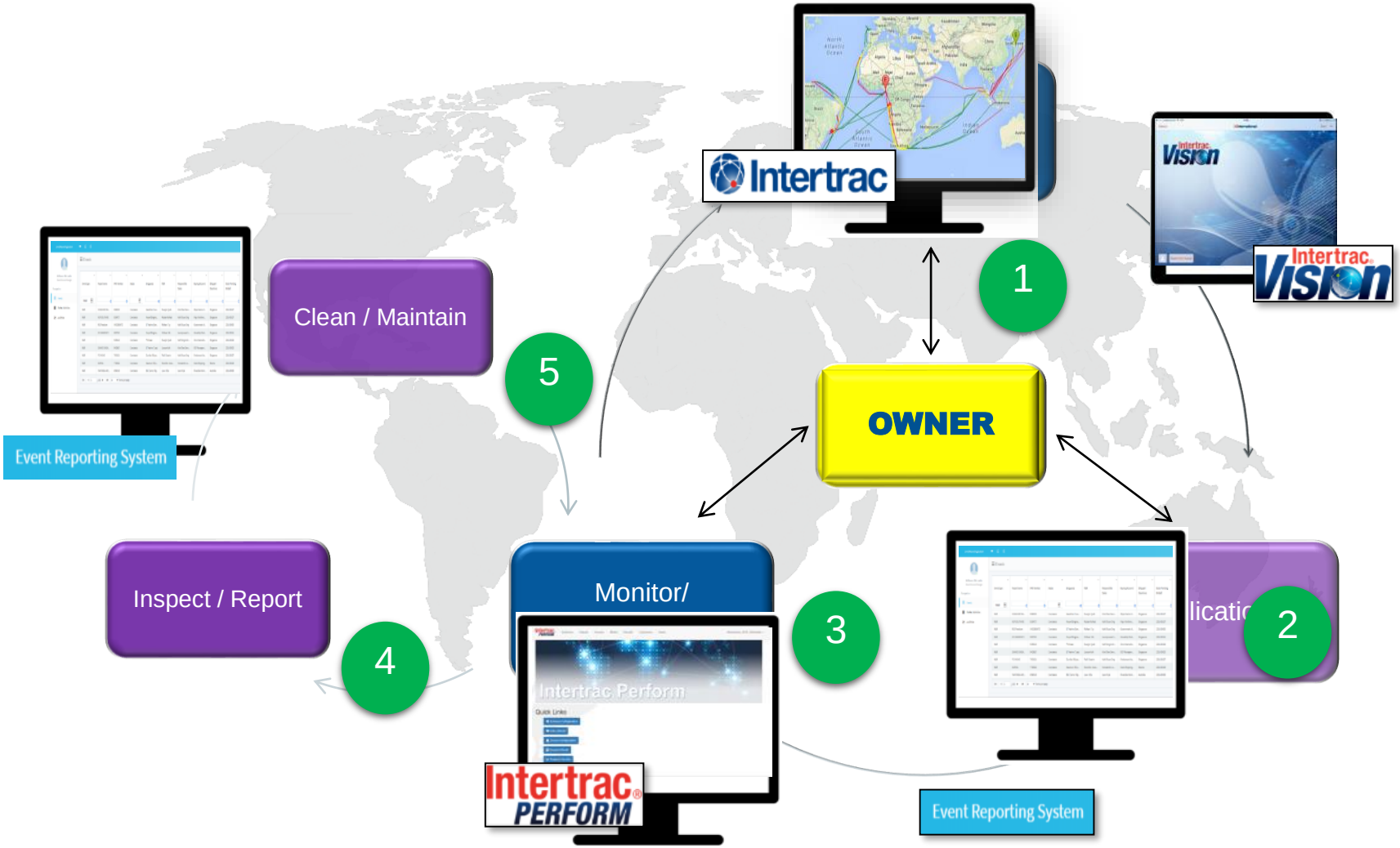
Intertrac Management Services



Intertrac Management Services

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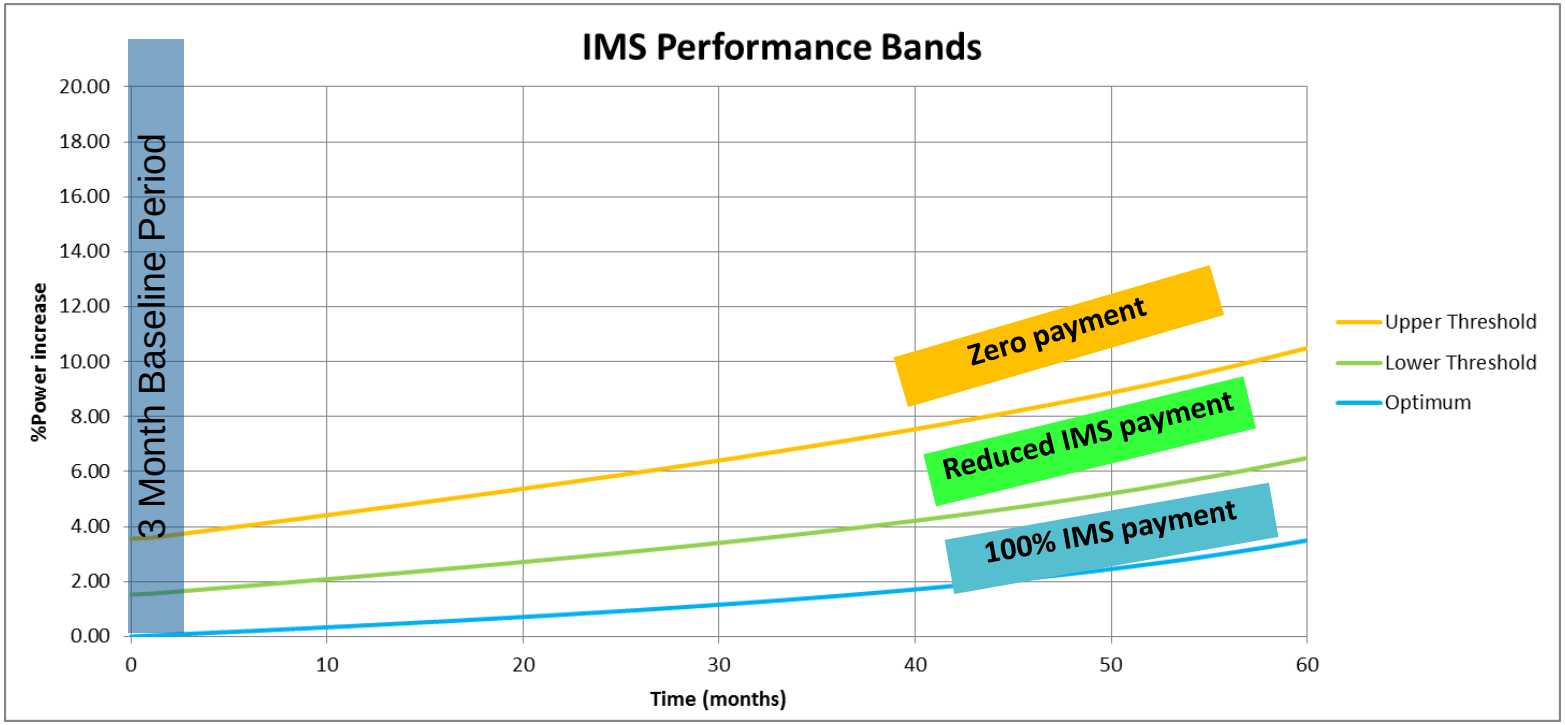
IMS Guide Proposal



- Measure baseline to establish post dry-dock hull performance (data dependent)
- Track and report hull performance versus baseline (Intertrac Perform)
- Monitor performance to identify triggers for inspection/intervention as needed

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How is IMS fee generated?

- IMS fee is unique to each ship and is driven by the value of the Hull Performance delivered by IMS

- Cost base for delivering the service:
  - Material cost of coating scheme
  - Personnel costs at dry-dock and in-service
  - Operational costs at dry-dock and in-service

- We build in an element of hull performance benefit delivered from maintaining the targeted performance

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How will the payment process work?

- Owner will pay an installation when vessel enters service (e.g. 50% of total IMS fee)
- Owner will pay a quarterly IMS service fee following an agreed payment schedule
- Annually, we will undertake a reconciliation of the fees paid by Owner over that full year i.e. fees paid vs. fees payable based on the performance of the Vessel.
- Owner will receive analysis report and calculations done in the reconciliation process.
- If Owner has overpaid based on actual vessel performance, we will reimburse for the difference between the amount paid and the amount due.

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Why select IMS vs Traditional Model?

- **Risk**: with IMS IP owners and IP spread the risk.
- **Hull performance partnership**: IP 100% aligned with owners/charterers – same motivations.
- **Drives Quality**: coating schemes, yard application, data collection/ analysis and reporting, underwater inspection/cleaning
- **Cash Flow**: IMS owners make quarterly performance payments
- **Avoiding fuel claims**: predictable performance to meet CP conditions.
- **Charterer engagement**: potential to engage charterer in tri-party performance agreement
- **Underwater cleaning efficiency/efficacy**: if needed within predicted trading conditions IP covers this cost and, importantly, be engaged in ensuring
    1. an early diagnosis and
    2. quality of clean is 1st class

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SCRUBBER: quick overview of paint and corrosion aspects

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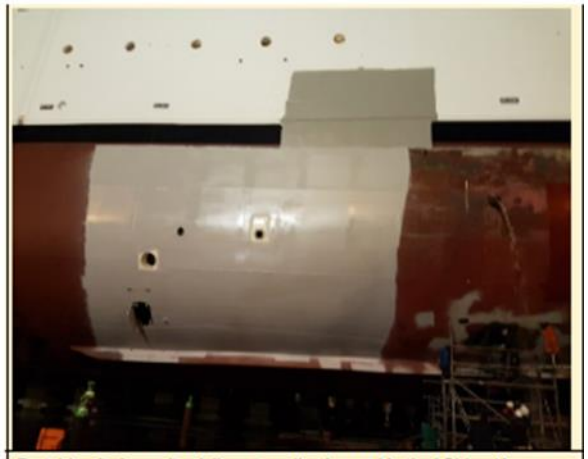

Portside aft view, after full coat application on Vertical Sides (Area Scrubber Scuppers Tank), with INterline 955 white, and with Intergard 7600 grey on Boottop and Topside.

Scrubber Tank 6105, D.F.T. Inspection.

Potential high acidity with risk of quick deep corrosion and pitting of the steel: the scrubber producer and designer must indicate the right coating.

Some required high quality epoxy vunyl ester glass flake solvent free 1 x 600 mic for the treatment of the tank and the buffer area around the overboard discharge. Pipes are an issue, fiberglass seems to be an option.

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GRAZIE – THANK YOU

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