

Marinfloc

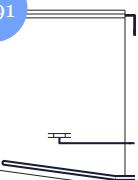
Wastewater Treatment Systems



MARINFLOC[®] 
A CLEAN SEA


Almost 30 Years of Innovation

1991




Prototype

1996




TD unit

1997



SDWU

1998




White Box

1999




Neptumatic

2000



Academy

2001



TD Pre-treatment

2002



STC kit

2003



Clean drains

2004



CD unit

2005




TD upgrade to CD

2006



Bridge control

2007



WBS report and Web service

2008



CD Pre-treatment

2009



Marinfloc bus 1.0

2010



Enviro Pilot

2011



Sewage treatment

2012




Deck drain treatment

2013



dRain

2014




Marinfloc bus 2.0

2015



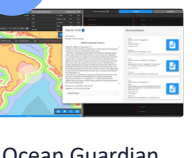
ASTS Baltic Sea

2016



CS Aeration

2017



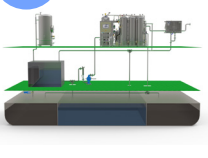
Ocean Guardian representative

2018



Polar area application

2019



EGR treatment

2020



Remote service and CBT

2021



MARS online

2022



SAFE

2023



CDM unit

2024



WTS iCER

Marinfloc - the Specialist in Wastewater Treatment

As Marinfloc approaches its 30th anniversary, we reflect on nearly three decades of pioneering advancements in marine environmental technology. Our journey, marked by relentless innovation and a steadfast commitment to a clean sea, has led to the creation of numerous solutions, see left side.

Our choice of flocculation technology is a testament to our dedication to excellence. Time and again, it has proven to be the most efficient solution for wastewater treatment.

Despite our achievements, many are still unaware of our story. So, here are some interesting facts about us.

Oily Water Separator TD and CD units

Innovative milestone
Our OWS, the “CD unit,” was the first MEPC.107(49) separator to receive the 5 ppm certificate, setting a new standard for environmental compliance.

Bonus fact
There is a finite number of people at Marinfloc who actually know what “CD” stands for. This secrecy has spurred fun speculation among the staff. Despite being nearly 20 years old, only a few people know the true meaning behind “CD.”

WhiteBox[®] system

Industry impact
The WhiteBox[®] has become a staple in discharge monitoring and record-keeping for maritime waste management. Interestingly, the brand name “WhiteBox[®]” is often used to refer to discharge monitoring equipment in general.

Bonus fact
The WhiteBox[®] was initially called the “Black Box” for a few hours—not our best idea. WhiteBox[®] unit number 1000 is installed on the P&O vessel Iona, which boasts an onboard gin distillery.

CD-EGR system

Innovative milestone
The CD-EGR is the first wastewater treatment unit approved by class to treat water from two different MARPOL annexes, showcasing our commitment to comprehensive and effective environmental solutions.

Bonus fact
The testing for the CD-EGR system was performed in Copenhagen by Marinfloc’s very own bus, making it a unique and memorable part of our history.

Neptumatic Sewage Treatment System

Innovative milestone
The Neptumatic system introduced the first marine sewage treatment plant capable of cleaning both black and grey water as early as 1975.

Bonus fact
During the type approval tests, the system was tested on an icebreaker, with samples picked up by helicopter every day for 15 days. Additionally, the oldest vessel with a Neptumatic Baltic Sea-approved system is nearly 100 years old.



Improving by Removing

- not only meeting but exceeding operational expectations

The maritime industry is accelerating its transition to greener shipping. This positive development is driven by shipowners advocating for faster technological and regulatory advancements, surpassing the pace set by the IMO. New, stringent emissions regulations often necessitate additional equipment onboard. However, space in the engine room and crew time for new operations are both limited. Combining treatment units for various waste streams presents a viable solution to this challenge. While a unified system for bilge, black, and grey water is technically feasible, the diverse effluent parameters complicate this approach. Yet, for waste streams with identical discharge requirements, innovative combined systems can exceed operational expectations.

The Marinfloc class-approved combined EGR bleed-off water and bilge water treatment system is pioneering in treating waste streams from two MARPOL Annexes. By integrating the WhiteBox® and segregation valves, the system ensures compliance with regulations prohibiting the mixing of MARPOL Annex I and VI wastes, and accurately records discharge data in the oil record book and EGR record book. Read more in detail on page 6.

As the industry explores fuels like ammonia and hydrogen, Marinfloc remains at the forefront of innovation, committed to developing solutions that not only meet but exceed environmental standards.

Marinfloc EGR Bleed-off Water Treatment System

Marinfloc's Exhaust Gas Water Treatment System (WTS) is compatible with both MAN-ES EGR and WinGD iCER setups. Building on years of industry experience, we utilize the proven Marinfloc flocculation process. This approach not only provides crews with essential tools but also guarantees cost-effective operations and clean water overboard. Constructed with resilient stainless steel, our system promises enduring performance. Moreover, for the convenience of your dedicated crews, we've incorporated digital functionalities for efficient documentation.

For ships powered by MAN-ES engines, there's an added advantage. The Marinfloc WTS can either be chosen as a standalone or upgraded to double up as a bilge water separator.

Choosing Marinfloc means you're not just achieving industry norms; you're pioneering in eco-compliance. Amplify efficiency, curtail emissions, and navigate towards a more sustainable maritime horizon.

Primary advantages

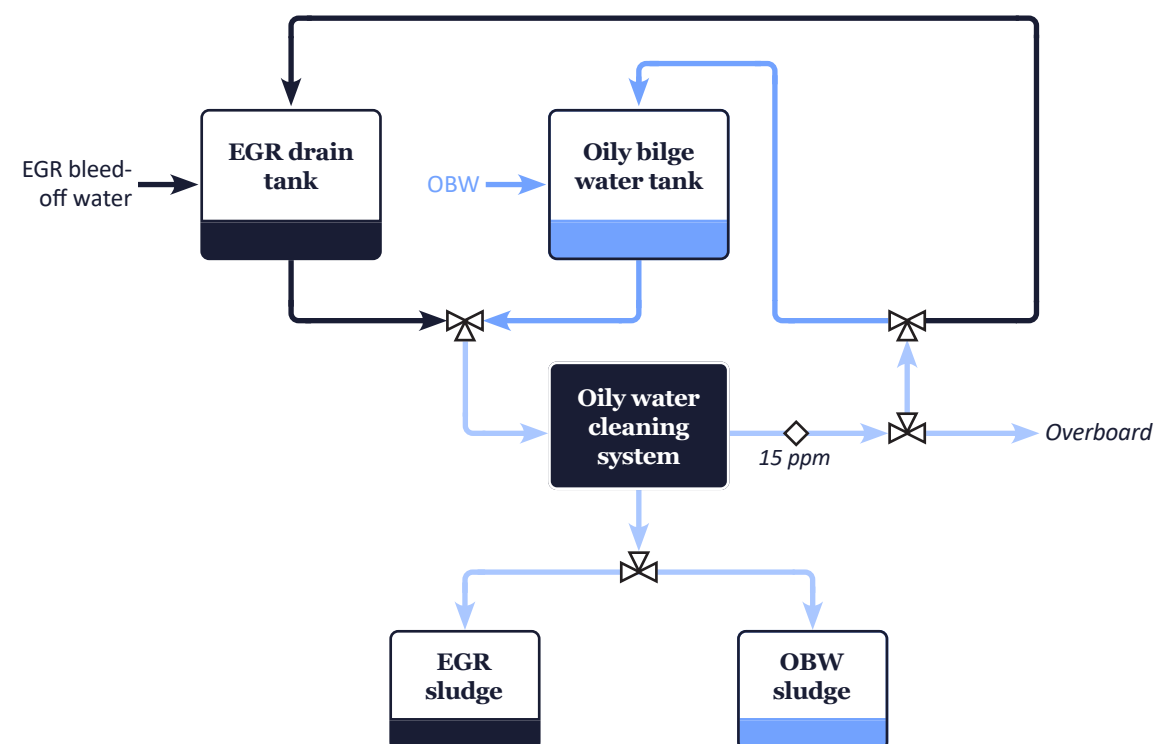
- Utilizes flocculation technology, eliminating the need for cartridge filters and centrifuges
- Approved for both MAN-ES and WinGD iCER
- Efficient energy use for minimized carbon footprints
- Modular design for easy retrofitting
- Cost-effective in operation
- Advanced HMI system with remote service and assistance, ensuring you're always connected and supported



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Combined EGR and Bilge Water Treatment System CD-EGR

The Marinfloc CD-EGR system is a class-approved, innovative solution designed to efficiently treat water from two distinct MARPOL Annexes—EGR bleed-off water (Annex VI) and bilge water (Annex I). This system combines advanced flocculation technology with streamlined design, offering a cost-effective and environmentally friendly approach to waste management on board.



Process description

The CD-unit can take suction from either the EGR bleed-off tank or the Bilge water holding tank. Three three-way valves connected to a selector switch secure that the waste streams are not mixed. The EGR bleed-off water is collected in a bleed-off water drain tank with a soot trap. The tank should be equipped with heating coils to heat the water to 40-55 °C. Alternatively, a heat exchanger is mounted

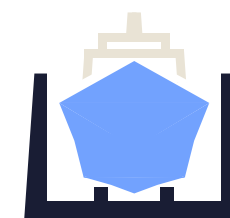
prior to the treatment unit. A solid sensor in the tank will detect solidification of soot. The system must have segregated sludge tanks as per the MARPOL requirements. The wastewater is treated overboard through a WhiteBox® by the CD unit and all vital system data such as tank levels, valve positions, oil content, discharged volume etc. is recorded and logged in the WhiteBox® recorder.

Primary advantages



for the Ship owner

- **Lower capital expenditures** as there is no need to procure a separate bilge water separator
- **Lower operational expenditures** – less classification costs, spares, consumables and documentation
- **More available space** onboard for improved cargo capacity
- **One high-end separator for two waste streams** means no need for budgetary trade-offs for new building projects



for the Ship yard

- **Lower capital expenditures** as there is no need to procure a separate bilge water separator
- **Simplified installation** with just one unit to set up
- **Lower cost for commissioning** with our streamlined solution
- Enjoy substantial **50% savings on documentation**



for the Engine maker

- High-quality water treatment ensures **compliance with the stringent environmental regulations**
- **Elevate your offerings** with our **industry-leading system**, turning it into a unique selling point that sets you apart from competitors
- Avoid customer frustration resulting from equipment standstill challenges - with a **continuously operating unit**
- Experience **50% savings on training, service, and spare parts** with a combined unit



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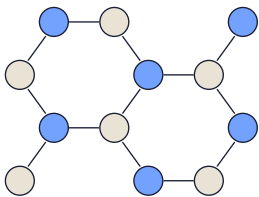
Bilge Water

- not just oil in water

No other waste stream on a ship is as closely linked to million-dollar fines and imprisonment as bilge water (engine room-generated wastewater). The term “magic pipe” is well-known among marine engineers, and many have seen them in action because they are still commonly used on ships.

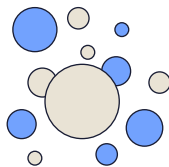
We believe that the persistence of this issue isn’t due to a lack of knowledge or trust, but rather because of outdated regulations that don’t account for real-time scenarios. Bilge water is not just limited to oil and water; anything brought into the engine room can end up in it. This includes washing chemicals, rust, sewage leaks, boiler water chemicals, lubrication, hydraulic oil, foaming liquids, CIP fluids, grey water leaks, metals, soot, bacteria, dust, and other contaminants. This complex mixture presents a significant challenge for marine engineers, as conventional static separators are designed only to treat bilge water consisting mostly of marine fuel oil and water—a limitation many manufacturers note in the fine print.

Marinfloc addresses this challenge head-on with its advanced bilge water separators, such as the Marinfloc CD separator, and our specialized pre-treatment units. Each solution is designed to handle the complex nature of bilge water independently, ensuring optimal treatment and compliance with environmental regulations for your safety.



the power of Flocculation

Our solutions use flocculation, where particles in wastewater are coagulated into larger aggregates called flocs. This method is particularly effective because these larger flocs settle out of the water more rapidly, allowing for efficient separation of contaminants. By using flocculation, Marinfloc ensures a superior level of wastewater purification, capturing even the tiniest of pollutants that conventional systems might miss – this includes also heavy metals and other contaminants that is not oil. Just because these contaminants are not regulated it does not mean we should dispose this into our oceans if you can avoid it.



the magic of DAF

Dissolved air flotation (DAF) is a water treatment method that removes suspended particles such as oil or sediments from wastewaters or other liquids. The separation is accomplished by dissolving air under pressure in the water or wastewater and then releasing the air at atmospheric pressure in a flotation tank. The released air forms tiny bubbles that cling to the suspended matter, causing it to float to the surface where it can be removed. This technique is widely used in land based industrial wastewater treatment units. Water being fed to the DAF tank is often (but not always) dosed with a flocculant to bind the particles into bigger clusters.

Marinfloc Oily Water Separator

- developed to meet onboard conditions

The CD unit is a highly trusted bilge water treatment system, utilized in over 700 vessels worldwide (both newbuildings and retrofits). It features a dissolved air flotation and flocculation technology, with a capacity range from 0.25 to 5.0 m³/h. What sets it apart is its ability to consistently treat bilge water to below 5 ppm, ensuring compliance with MARPOL standards. Designed with onboard practicality in mind, it features an intuitive HMI screen for user-friendly operation and adaptability to diverse bilge water compositions. We also take pride in having the lowest operational expenses on the market.

Primary advantages

- Flocculation technology: no cartridge filters nor centrifuges required
- Adjustable to the ship’s specific bilge water composition
- Type-approved to 5 ppm with Deckma
- Low energy consumption for low carbon footprints
- Easy to install, easy to retrofit
- Can be integrated with the WhiteBox®
- Touchscreen control cabinet available for smart functions and online connectivity
- Low operational cost



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“
It should be understood that a gravitational filtering equipment cannot be expected to be effective over the complete range of oils which might be carried on board ship, nor can it deal satisfactorily with oil of very high relative density or with a mixture presented to it as an emulsion.
MEPC.60(33)

Marinfloc Pre-Treatment unit

- breaking emulsions and preserving filters

For years, the maritime industry has faced the persistent challenge of emulsified bilge water, a challenge that has become even more topical as the industry explores new advanced fuel types. As early as in MEPC.60(33), it was highlighted that traditional gravity separators might not adequately handle bilge water containing oil presented to it as an emulsion. With the industry still relying on the same type of separators, the question arises: how can we expect better results? Marinfloc’s Pre-treatment system offers a compelling answer.

Building on Marinfloc’s trusted and proven technology, this fully automatic system not only breaks down emulsions by flocculation but also ensures that the water discharged consistently remains below 15 ppm, seamlessly integrating with your existing oily water separator.

Primary advantages

- Complements your existing OWS, ensuring water discharged is always below 15 ppm
- Drastically reduces your filter expenses, offering a return on investment in as little as a year
- Regulation-compliant: Achieve optimal results without the need to update the IOPP-certificate
- User-friendly: Designed for ease, it offers a plug-and-play installation process
- Space-efficient: Its efficient design eliminates the need for additional tanks onboard
- Can be upgraded to an approved MEPC.107(49) unit



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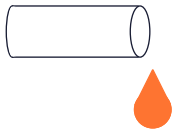
Oil Content Meters



OCMs are used to monitor bilge water oil content, also known as 15 ppm bilge alarm.

High ppm and alarms are frequently blamed on oil content meters. “There is no oil in this water” a disgruntled engineer laboring with the bilge water discharge could say. ppm stands for part per million and the meters are designed to detect oil content levels at these extremely low concentrations. It’s a popular misperception that water with a 100-ppm oil concentration will have a sheen on the surface. Emulsified oil leaves no sheen on the water’s surface, and it’s hard to tell how much oil is in a sample by looking at it. Sure, the OCM will alarm for rust and dust at some point, however the source of high oil content reading is found upstream. Operators should address the underlying issue rather than the symptoms. Instead of condemning the meter, operators should accept this situation and instead consult the OWS manufacturer if the water cannot be treated to meet acceptable levels.

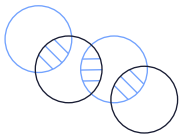
Magic Pipe



A magic pipe is a hidden modification to a ship’s oily water separator or other waste-handling equipment that allows waste liquids to be discharged in violation of maritime pollution regulations.

Such modifications to equipment may allow hundreds of thousands liters of contaminated water to be discharged untreated, resulting in widespread pollution of marine waters. To discharge untreated wastewater directly into the sea, a pipe can be improvised aboard ship using available hoses and pumps. Magic pipe cases frequently involve the falsification of records, as ships are required to keep documentation of waste and its treatment. These cases usually result in hefty fines for shipping companies and even prison sentences for crew members. The pipe is dubbed “magic” because it bypasses the ship’s bilge water separator directly overboard. As a result, the bilge water “magically disappears”. The use of magic pipes continues to this day, as do efforts to improve bilge water treatment in order to eliminate the need for these shortcuts.

Emulsions



An emulsion is a combination of two liquids that are typically immiscible due to liquid-liquid phase separation.

Already in MEPC.60(33), it was stated that gravimetrical separators could not be expected to clean emulsified bilge water to a satisfactory level.

Still today, a majority of OWS on the market are based on gravimetrical separation and filtration. This has created a discrepancy between products just fulfilling MEPC test standards and real shipboard conditions.

Emulsions cannot be separated gravimetrically, and filters often fail to preserve performance in shipboard conditions beyond the 120 minutes required for MEPC.107(49) certifications. The IMO standard has failed to replicate shipboard conditions, which has led to an industry of basic and cheap separators that however require frequent filter maintenance and baby sitting.



Compliance

- not just obeying the law

Compliance means obeying the law. Ethics is the intent to observe the spirit of the law, and the expressed intent to do what is right. The effects of unethical behavior on a shipping company and its personnel, both on land and at sea, can be catastrophic. Million-dollar fines, lengthy probation periods, and costly environmental compliance procedures is a consequence of not being compliant. Magic pipes do unfortunately not belong to the past. Recent incidents in the United States have highlighted the need for a well-implemented bilge management program as well as adequate environmental compliance programs.

The US regulation with the whistle blower’s protection act, false statements act, Sarbanes-Oxley act of 2002 (obstruction of justice), witness tampering, Act to Prevent pollution by ships and more, enables the Department of Justice to prosecute individuals and shipping companies for violations also committed outside US waters. Prioritizing bilge water compliance is important to protect your crew and the company and has proven to be a smart business decision. Marinfloc has over 25 years of expertise solving the challenges associated with bilge water and understands how to limit the risks for noncompliance.



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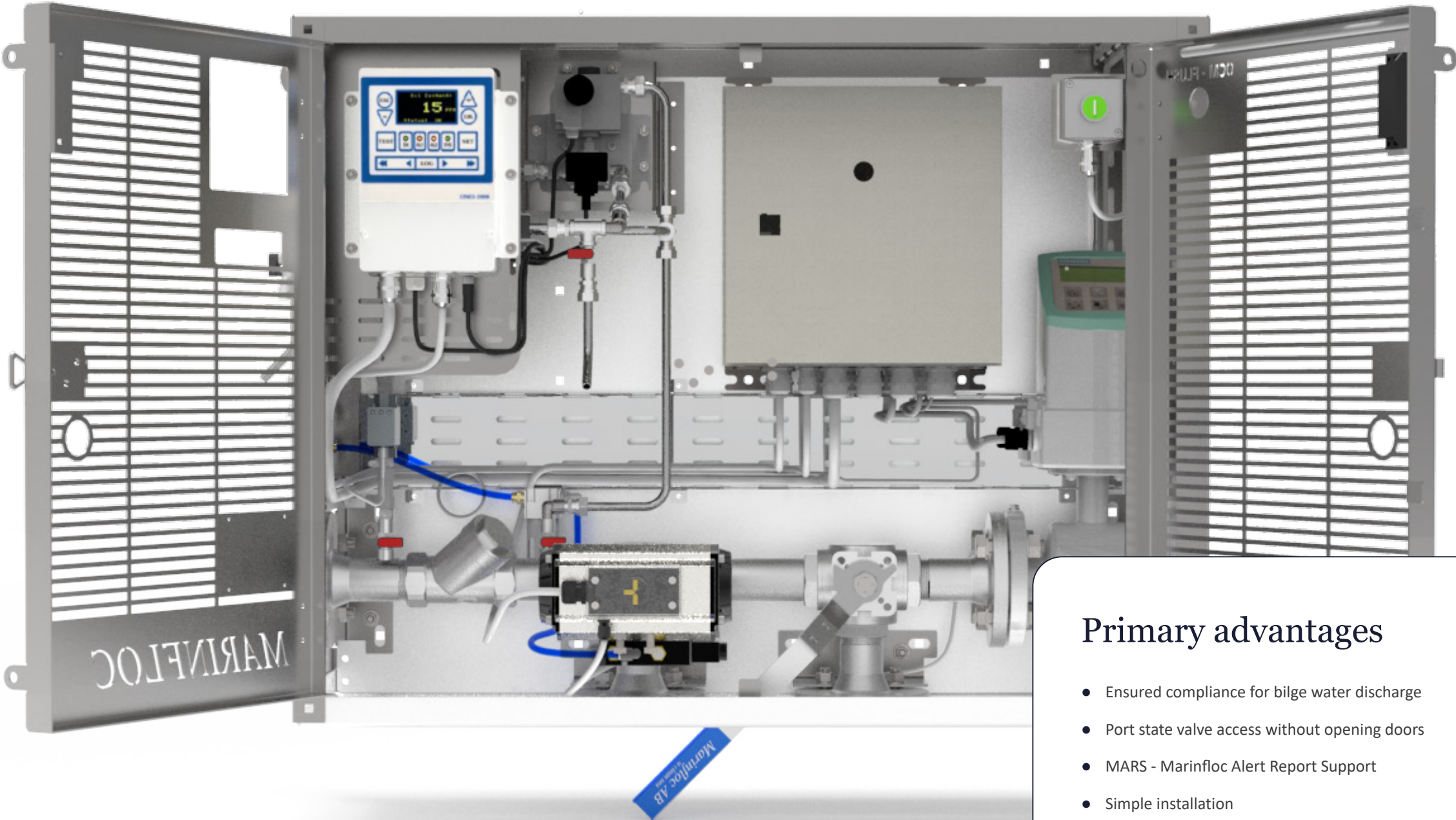
WhiteBox®

- keeping the crew safe from non-compliant discharges

The Marinfloc WhiteBox® is a failsafe overboard discharge monitoring and control unit. It is installed between the oily water separator and the overboard valve. It prevents non-compliant discharge of bilge water and helps to protect the crew from accusations.

All vital discharge data is recorded and linked to the vessel's GPS; the WhiteBox® houses all necessary monitoring and control equipment for the overboard discharge.

A digital recorder stores all critical data such as oil content, valve settings, flow via the oil content monitor and overboard flow, door open/closed, vessel position, and time.

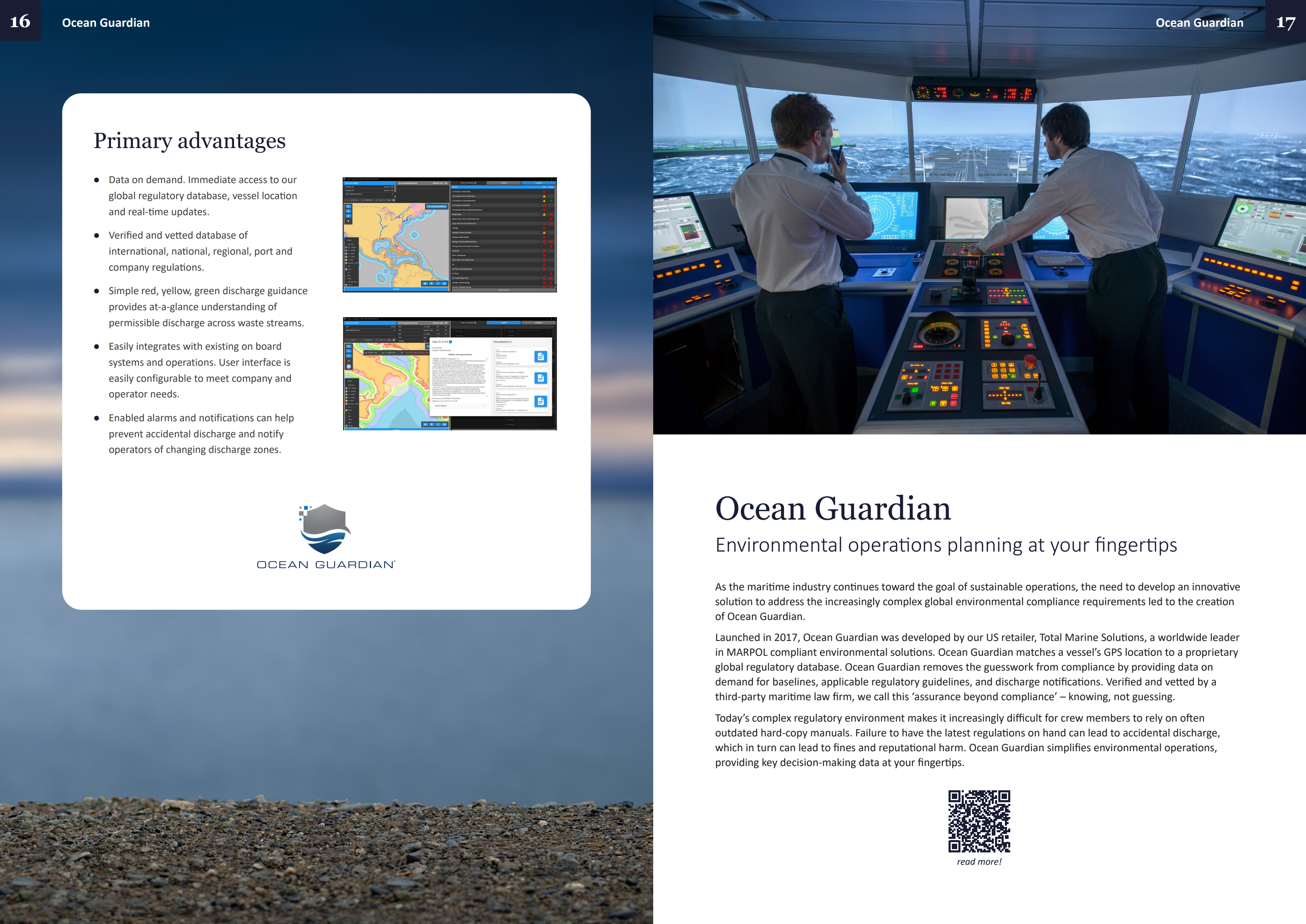


Primary advantages

- Ensured compliance for bilge water discharge
- Port state valve access without opening doors
- MARS - Marinfloc Alert Report Support
- Simple installation
- MESQAC compliant

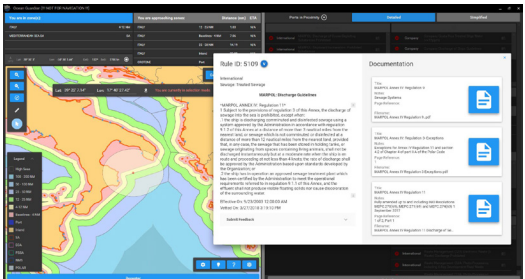
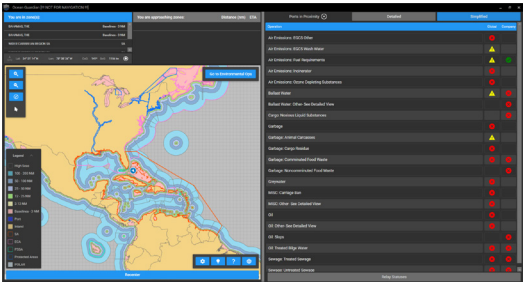


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Primary advantages

- Data on demand. Immediate access to our global regulatory database, vessel location and real-time updates.
- Verified and vetted database of international, national, regional, port and company regulations.
- Simple red, yellow, green discharge guidance provides at-a-glance understanding of permissible discharge across waste streams.
- Easily integrates with existing on board systems and operations. User interface is easily configurable to meet company and operator needs.
- Enabled alarms and notifications can help prevent accidental discharge and notify operators of changing discharge zones.



Ocean Guardian

Environmental operations planning at your fingertips

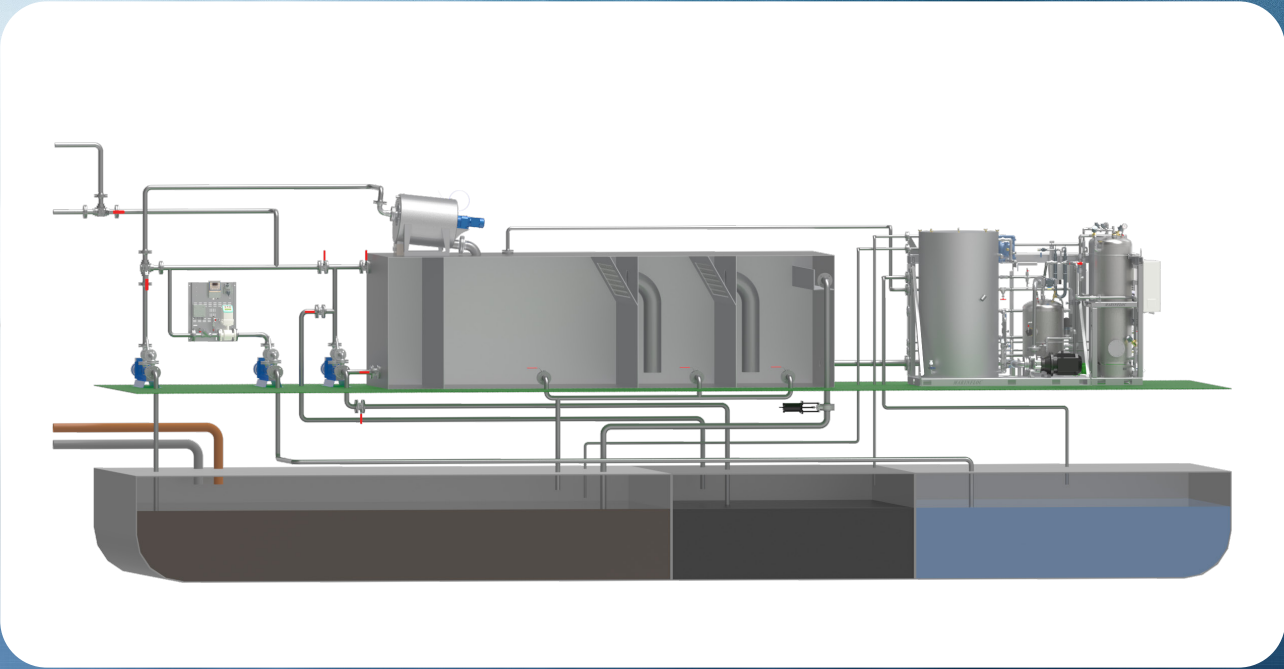
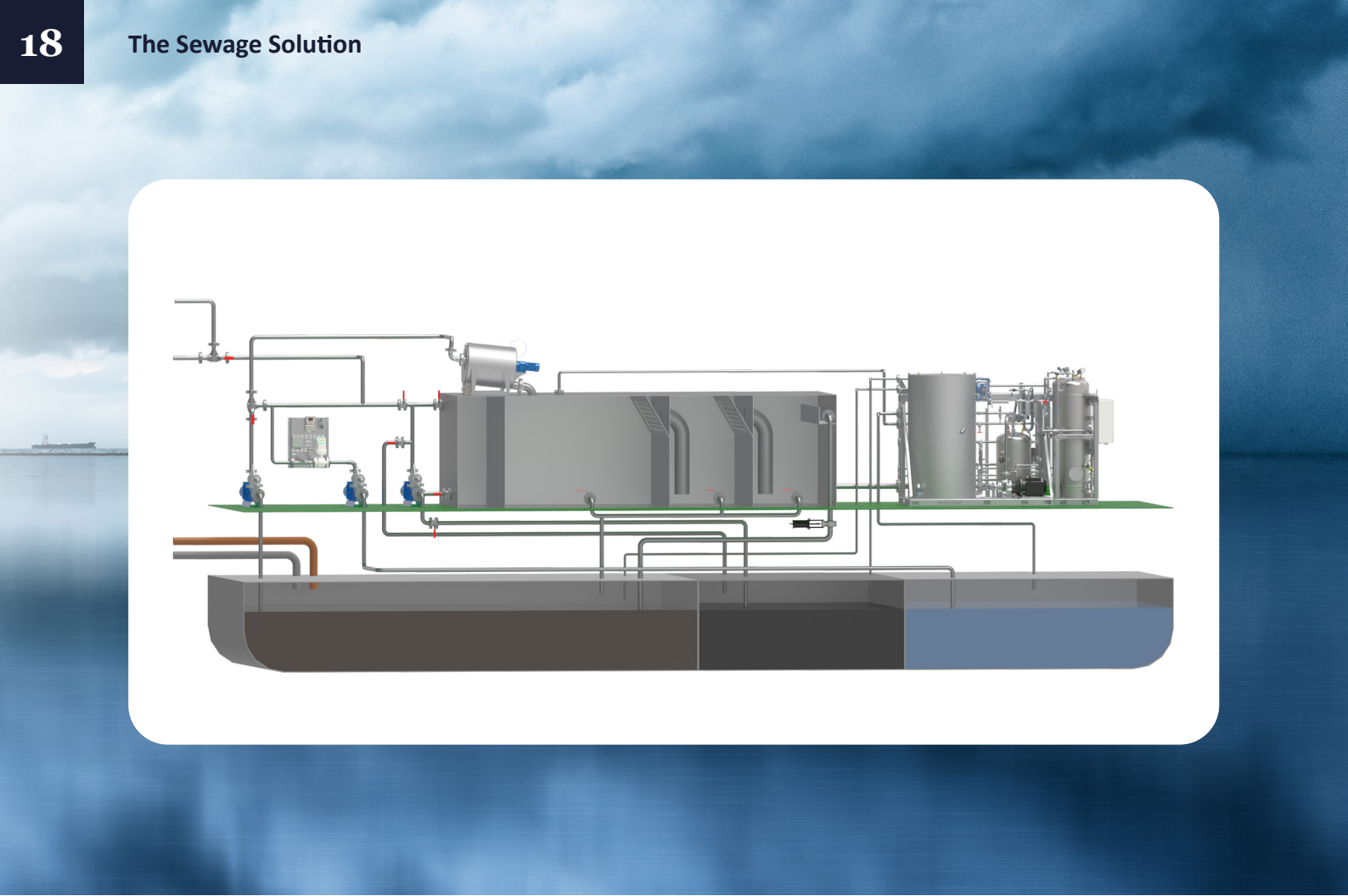
As the maritime industry continues toward the goal of sustainable operations, the need to develop an innovative solution to address the increasingly complex global environmental compliance requirements led to the creation of Ocean Guardian.

Launched in 2017, Ocean Guardian was developed by our US retailer, Total Marine Solutions, a worldwide leader in MARPOL compliant environmental solutions. Ocean Guardian matches a vessel's GPS location to a proprietary global regulatory database. Ocean Guardian removes the guesswork from compliance by providing data on demand for baselines, applicable regulatory guidelines, and discharge notifications. Verified and vetted by a third-party maritime law firm, we call this 'assurance beyond compliance' – knowing, not guessing.

Today's complex regulatory environment makes it increasingly difficult for crew members to rely on often outdated hard-copy manuals. Failure to have the latest regulations on hand can lead to accidental discharge, which in turn can lead to fines and reputational harm. Ocean Guardian simplifies environmental operations, providing key decision-making data at your fingertips.



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Marinfloc Sewage Treatment Systems

- solutions tailored to the unique needs of your ship

Marinfloc designs custom sewage treatment systems that handle both black and grey water, fully compliant with MEPC.227(64) including § 4.2, catering specifically to the stringent requirements of the Baltic Sea and future special areas.

Diverse vessel requirements, one optimal solution

Vessels vary significantly in design, the number of persons onboard, tank arrangements, and trading areas. Marinfloc excels in creating optimized sewage treatment solutions that cater to these varied conditions, ensuring each system is tailored to the unique needs of the ship.

Retrofit and newbuild solutions

For retrofit projects, Marinfloc specializes in maximizing existing onboard components to develop cost-effective, time-efficient, and environmentally friendly solutions. Whether reusing, repairing, or converting tanks, our expertise in sewage treatment ensures optimal design and implementation. For new builds, integrating the bioreactor within the vessel structure optimizes both space and performance. Marinfloc offers two models: the standard Sewage Treatment System (STS) for general use, and the Advanced Sewage Treatment System (ASTS) for higher regulatory demands.

Marinfloc Neptumatic ASTS

- tailored, compact, compliant

Designed for diverse maritime needs, the Marinfloc Advanced Sewage Treatment System (ASTS) offers a customized treatment solution for black and grey water. It seamlessly integrates with both new and existing vessel structures, optimizing space and ensuring effective treatment. Each ASTS includes a turbidity meter, guaranteeing precise effluent quality monitoring.

Baltic Sea compliant

Sail the global and Baltic waters confidently with the ASTS, fully compliant with MEPC.227(64) including the Baltic Sea § 4.2 amendment. This certification reflects our commitment to high performance and environmental preservation.

Primary advantages

- Approved for Baltic Sea operation as per MEPC.227(64) § 4.2.
- Utilizes hull tanks to efficiently use space, freeing up additional room in the engine area
- Low operational costs with reliable technology and a biological step to reduce waste and chemical use
- Provides necessary tools for compliance to global discharge standards in a cost-effective manner
- Designed for retrofits



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Marinfloc Service & Support

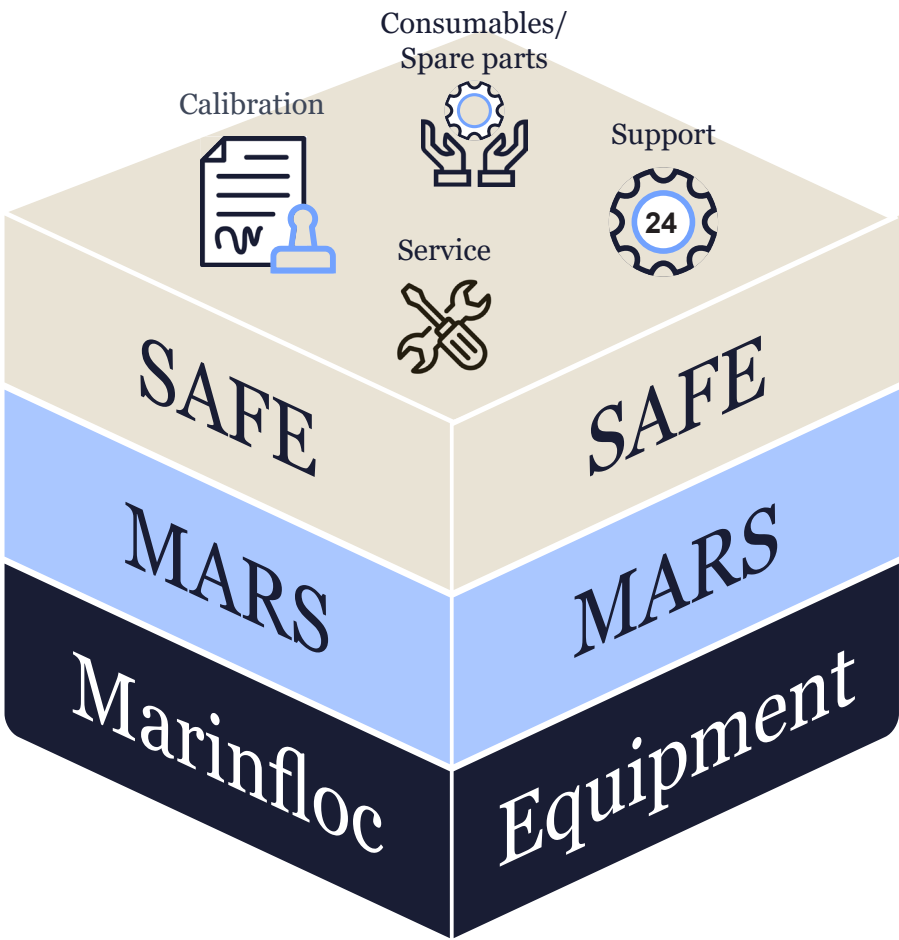
- we support every part of the value chain from the start

At Marinfloc, we understand that smooth operations are vital for our customers’ success. That’s why our Service & Support department is dedicated to providing top-class assistance worldwide. Whether you’re on board, remote, or need personal support, we’ve got you covered to ensure your Marinfloc equipment operates seamlessly, no matter where you are.

Marinfloc Service Agreement

- global reach, personal touch with SAFE

With our comprehensive service agreement (SAFE), you not only gain access to our exceptional support functions but also enjoy exclusive benefits. From discounts on all purchases to access to our online portal (MARS), SAFE ensures that you get the most out of your Marinfloc equipment investment. Additionally, our service engineers conduct annual visits onboard to ensure the safety and efficiency of your vessel, crew, and operations. With SAFE, we agree on a compliance solution tailored to your vessel’s specific needs. We ensure that you have access to all necessary service, assistance, facts, and knowledge 24 hours a day, 365 days a year.



Onboard, onshore, and across your fleet

MARS is a cloud-based compliance and monitoring system that integrates with your Marinfloc equipment, including the WhiteBox®. It provides real-time data, intelligent alerts, and standardized reports, ensuring complete oversight and operational confidence – whether you’re at sea or ashore.

Confidence onboard – clarity ashore

For crew, MARS delivers system status in real time – with automatic logging of alarms, actions, and performance trends. Compliance becomes a seamless part of daily operations, and inspections are no longer a stress factor – the data is already there, structured and correct. For shore-based teams, MARS enables fleet-wide monitoring, historical tracking, and proactive risk management. Whether you’re preparing for a vetting inspection, navigating an ECP process, or optimizing spare parts planning, MARS gives you the information and tools you need – instantly.

What sets MARS apart

- Inspection readiness – always*
Structured reports aligned with PSC, USCG, SIRE and ECP requirements – no manual reporting required.
- Real-time alerts and risk management*
Detect deviations before they become incidents – act early, reduce downtime, and stay compliant.
- Geographic discharge monitoring*
Know where, when, and how discharges occur – mapped and documented for full traceability.
- Fleet-wide visibility*
Monitor single vessels or entire fleets in one interface – compare, analyze and benchmark.
- Planned maintenance and purchasing*
Predict trends, plan spare part needs, and reduce waste – supporting both compliance and cost efficiency.
- Cyber-secure and certified*
Built to protect your data – fully ISO 27001 compliant and ready for integration with other platforms (API-ready).

A strategic asset, not just a system

MARS is more than just a digital platform – it’s a vital component of Marinfloc’s Big 5. “The Big 5” process is a strategic workflow designed to incorporate all vital steps for the successful management of wastewater treatment systems. This method ensures that every critical aspect – ranging from technical analysis and product development to installation, training, and long-term support – is included.



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Lifetime Service and Support

- direct support for every demand

Marinfloc provides a range of service solutions, including support and commissioning. Our support organization is available to you by phone and email for any problems you might encounter for your continuous operation. If necessary, the expert assistance can also provide you with missing or lost documentation to support regulatory compliance, thus reducing the risk of penalties or sanctions.

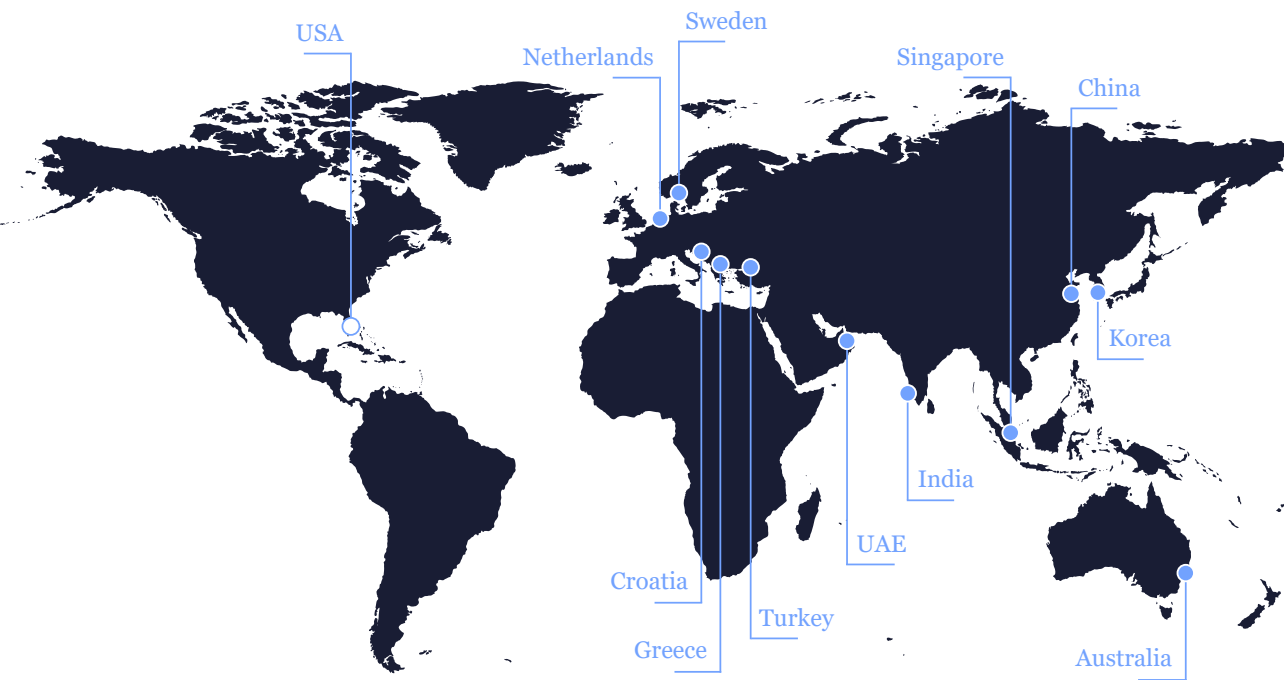
We have a range of highly qualified service engineers available for personal attendance who can visit your vessel anywhere in the world or travel with it between destinations while it is in operation.

Our service locations with engineers and assistance are spread out across the globe and cover all major time zones, ensuring prompt and skilled support for every demand 365 days a year.

Calibration Services

- at your disposal, worldwide

We are here to help you maintain calibration compliance for your IMO regulated equipment. We have a 24-hour turnaround commitment for our calibration services and have authorized service stations worldwide. Get in touch with us and discuss your needs, we help many clients in planning calibration needs to ensure compliance.



Original Spare Part Supply

- anytime, anywhere

We are fully committed to ensure that your Marinfloc equipment(s) operates efficiently over the years to come. We supply daily a complex worldwide network of vessels and agents to meet their demands for spares and consumables.

An average of 95% of our requests are cleared and shipped within 24 hours. With over 1,000 sqm of warehouse, 75,000 parts always in stock, we are committed to help your running the equipment(s) as designed and minimize any downtime. In addition, our dedication and expertise has served many clients design successful maintenance plans with the aim of preventing failure, downtime, or inefficient performance.



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Marinfloc offers world class, future proof, wastewater treatment solutions – for your peace of mind.

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