

PROTECTING MARINE LIFE

ENVIRONMENTALLY FRIENDLY BALLAST WATER TREATMENT



PROTECTING THE WORLD'S MOST PRECIOUS RESOURCE



A THREAT: The introduction of non-indigenous species from discharged ballast water is a threat to the global environment. Norway is a seafaring nation – the oceans are important to our fisheries and aquaculture, and we recognized early on that they are a source of food for the entire world. Norway has therefore been a strong advocate of implementation of the International Maritime Organization’s (IMO) Ballast Water Convention worldwide.

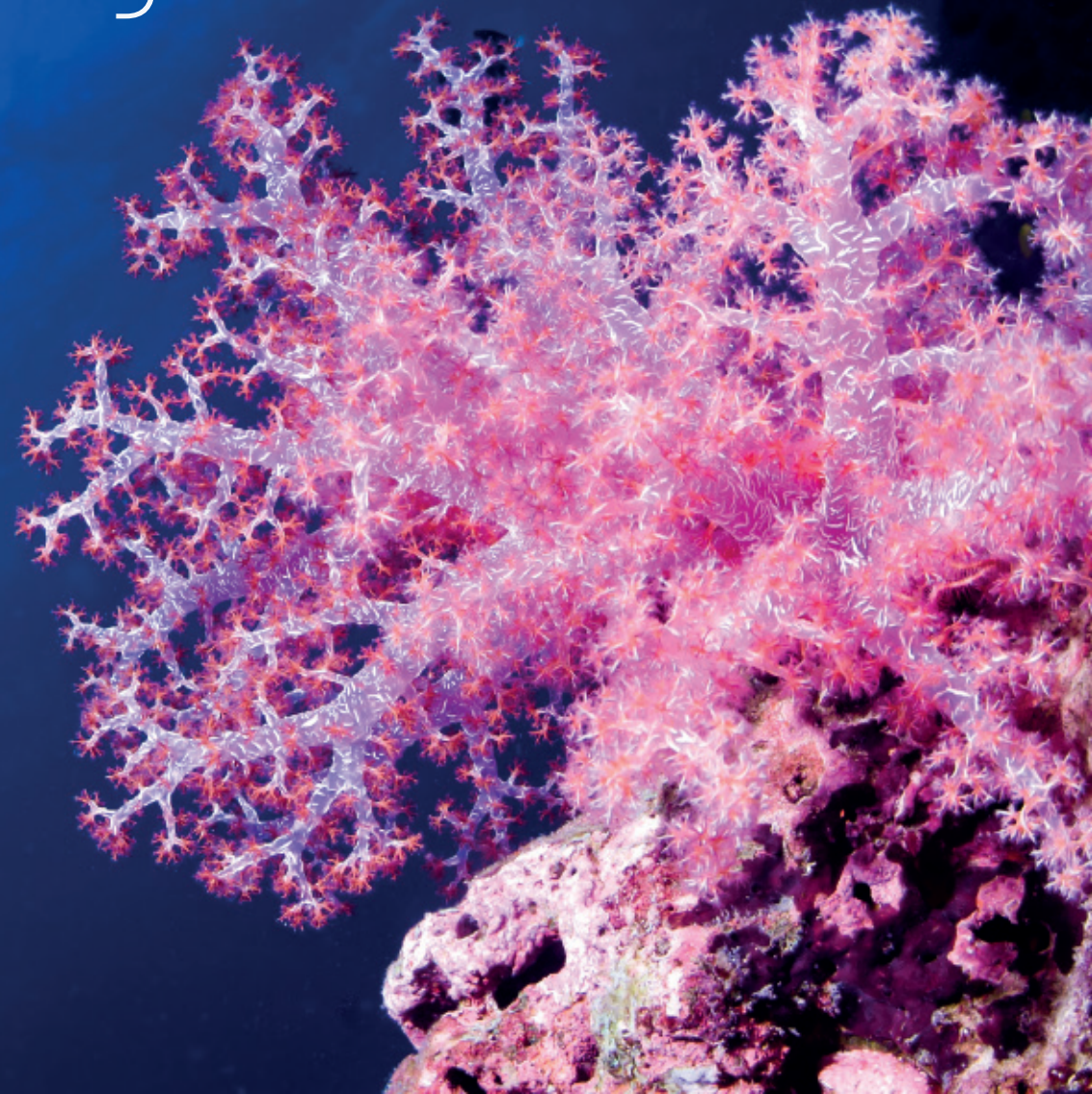
A PIONEER: Optimarin was the first company to deliver a commercial system for the treatment of ballast water system for a commercial vessel in 1999. Our Optimarin Ballast System (OBS) was type approved (TA) by the Norwegian Administration and DNV in November 2009. Our customers include major shipowners and operators all over the world. As our global customer base has expanded so has our service network, giving us a comprehensive presence to match our high-quality reputation in this emerging market.

US Coast Guard TA was obtained in December 2016 as the first company in the world. This clearly demonstrates our system’s outstanding performance.



CLEAN BALLAST WATER

- our responsibility to nature



The UN considers the introduction of non-indigenous oceanic species to be one of the top four serious threats to the global environment. At any given time, 35 000 ships are en route on the water of the Earth and more than 3000 species are being transported in their ballast tanks. The UN's International Maritime Organization estimates that ten billion tons of ballast water is transported around the world every year. The past decade has seen a marked increase in the spread of species to areas where they do not naturally belong. This creates an imbalance in ecosystems and is a serious environmental threat.

Many times the invader has no natural predator and the original species become extinct and the entire marine ecosystem is disrupted. This has dramatic consequences for biodiversity and for industries such as fishing and aquaculture.

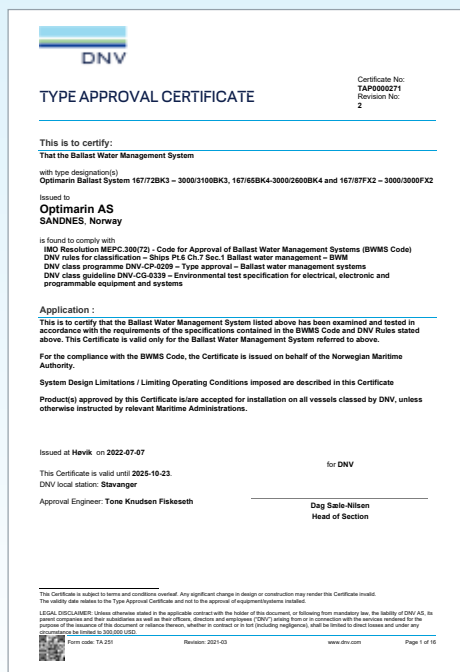
- 1 Global warming
- 2 Pollution on land and at sea
- 3 Over-fishing
- 4 **Non-indigenous species (in ballast water)**



TRUST & ACHIEVEMENTS

- tested - approved - safe

After several years of testing, developing and patenting new technology, Optimarin obtained type approval for its treatment system in 2009, in accordance with Guideline 8 and the “INTERNATIONAL CONVENTION FOR THE CONTROL AND MANAGEMENT OF SHIPS’ BALLAST WATER AND SEDIMENTS, 2004”, and according to Resolution MEPC.300(72), BWMS Code. But for Optimarin, it is not enough to simply be approved. We operate in accordance with NS-EN ISO 9001:2015 & 14001:2015 and our vision is to have the most environmentally friendly ballast water treatment system in the world.



Type Approval from Class Societies:

Lloyd's | Korean Register | ABS | Bureau Veritas | China Classification Society | RINA | RMRS | CRS | IRS | PHRS | IBS | PRS | Turk Loydu

Type Approval from Flag states:

Italian Coastguard | French Maritime Administration | Luxembourg | Maritime & Coast Guard Agency | MLIT | Turkey Ministry of Transport and Infrastructure | The Hellenic Republic | Transport Canada, Marine Safety & Security

All our approved certificates can be downloaded from our website: <https://optimarin.com/compliance/>



INNOVATION

Optimarin's vision is to remain a leading provider of ballast water treatment system and leverage our technology and know-how to develop applications for a cleaner marine environment.

Optimarin has through its 30-year history been a leader in the development of the BWTS industry. Being an early industry pioneer has not stopped the company from continuously improving its product, work processes and service offering to our customers. Achieving the USCG approval in 2016, as the first company in world, is a sign of our industry status.

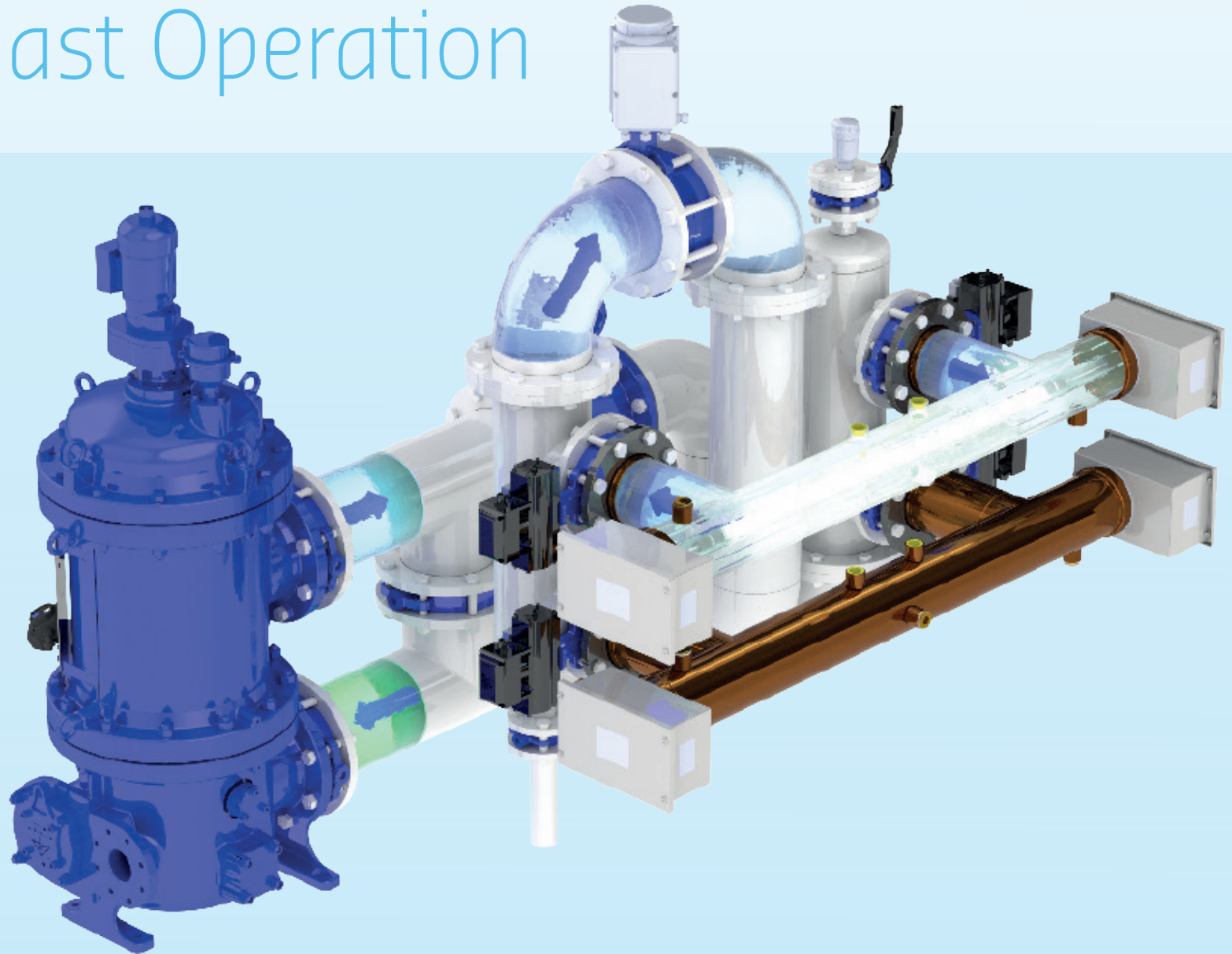
Going forward, we will focus our product development work along two dimensions based on customer feedback and market requirements:

- Improving the existing system with respect to footprint, functionality and operational features
- Using the company expertise to develop new applications based on our technology knowledge and experience with the goal of expanding into new markets.

Research & Development will be based on our overall goal and the aim is to promote a cleaner environment through innovation, meeting our customer's demand with cost efficient solutions and contributing to the development of our industry.

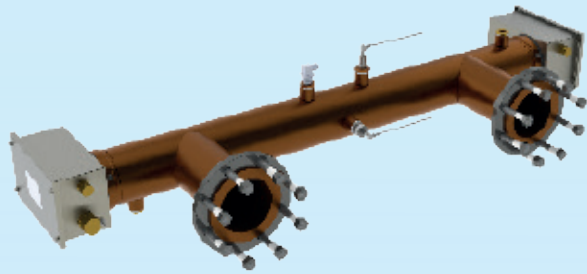
SIMPLE & RELIABLE

- Ballast Operation



DURING BALLASTING: The ballast water flows through Optimarin's proprietary filter. The filter removes larger organisms and particles and back flushes them overboard at the ballasting location. After passing the filter, the ballast water continues through the UV chambers on its way to the ballast tanks. The UV light kills or inactivates organisms, viruses and bacteria in the ballast water.

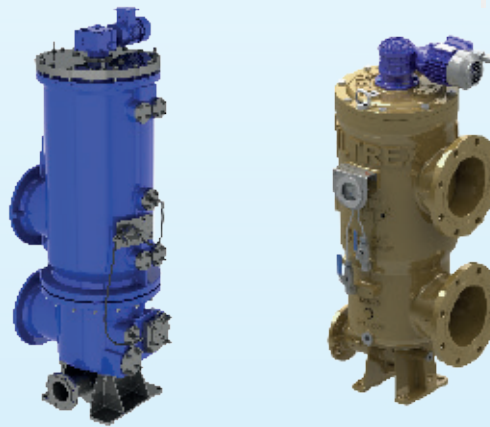
DURING DE-BALLASTING: The filter is automatically bypassed during de-ballasting, and the ballast water receives a second UV-treatment during discharge as a safeguard to ensure compliance.



UV SYSTEM

The UV system was developed based on 20 years' experience of water injection on offshore platforms, water treatment for fish farming and drinking water plants in Norway.

- High power UV for the efficient killing or inactivation of organisms, bacteria and pathogens in ballast water.
- One UV lamp per chamber (167 m³/h flow rate per chamber).
- Installed on single or dual layer manifold for optimal space utilization.
- UV and temperature sensor in each chamber.
- Automatic flow reduction to treat more challenging waters.
- OptiWash – CIP (cleaning in place) functionality for minimum maintenance. (Optional)



FILTERS

Optimarin offers two different filters: B&K (25µm basket) and Filtrex (20µm basket). The filters have automatic back-flushing and are self-cleaning.

- Removes large particles and organisms.
- Low pressure loss of only 0.1 – 0.5 BAR.
- Bypassed during de-ballasting.
- Capacity matches vessels need.
- Capacity does not need to match UV capacity for different flow during intake vs discharge.



CONTROL SYSTEM

The Ballast Control System allows easy operation of the Optimarin Ballast System.

- User-friendly interface.
- Touch screen operation.
- Multiple choices for integration to ship automation system for complete control.
- Extensive logging and troubleshooting functionality.
- Several possibilities to connect external valves to detect system compliance.
- Modular design for easier and cheaper installation.
- Ready for OptiLink (cloud service).

A FLEXIBLE SYSTEM

- for any vessel

The Optimarin Ballast System is easy to install on board existing ships (retrofit) as well as on newbuilds. The modularized system is very flexible, with a relatively small footprint and weight, and will fit vessels of all kinds and sizes. The OBS can be delivered as a complete skid or as a customized solution. It accommodates a wide range of ballast water capacities and can handle flows from 25 m³/h to 3000 m³/h.

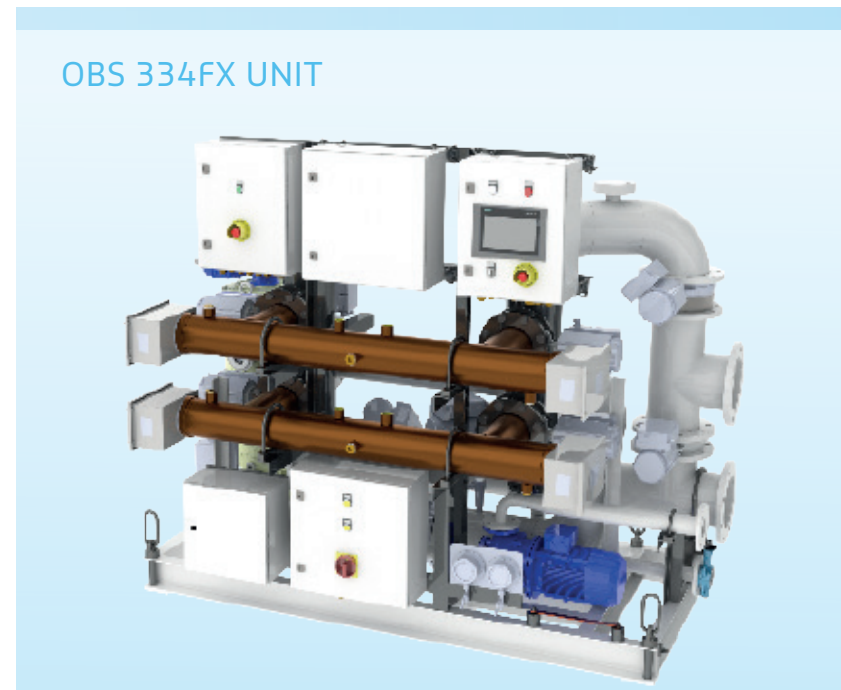
CUSTOMIZABLE AND FLEXIBLE FOR A PERFECT FIT AND USAGE ON BOARD

Customization: The system can be delivered in parts or as a complete unit. When delivered in parts it can be seamlessly installed with extremely low footprint.

Our compact units come in unlimited sizes and capacities making them a perfect fit for all vessels. All units are delivered with bypass possibilities and back flush pump. No other components are needed for a complete BWTS installation.

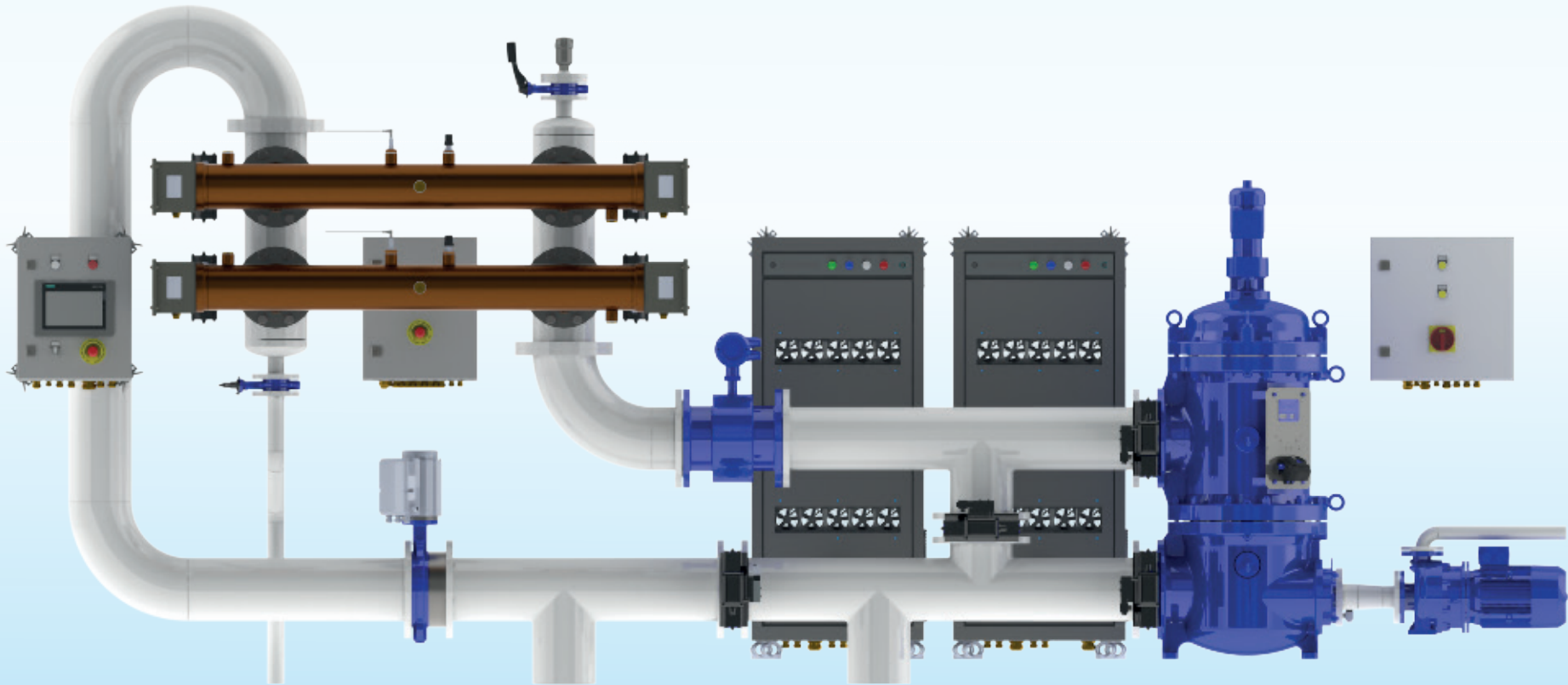
Redundancy: Each UV lamp is individually operated and can be started as needed by the cargo operation. This has several advantages:

- there are always redundant UV power capacity on systems with two or more UV lamps
- optimize power consumption to all operations – loading, discharging and stripping – by utilizing only the minimum required numbers of lamps.



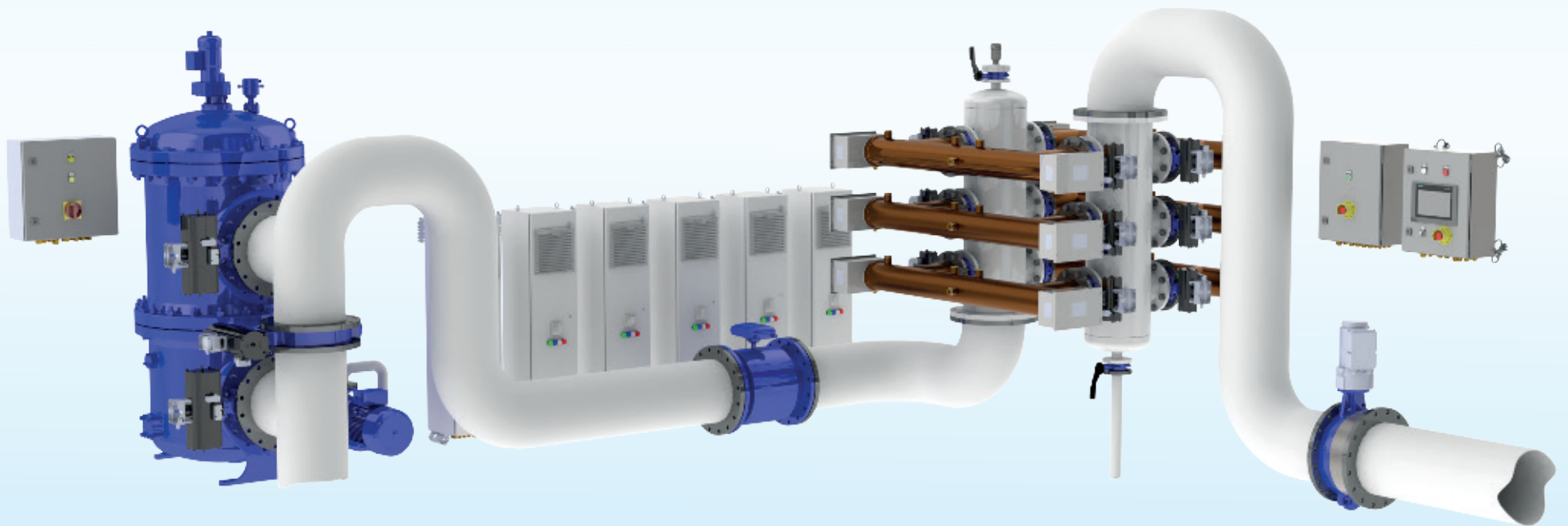
COST-EFFICIENT RETROFIT

- anywhere you want on the vessel



334 M³ SYSTEM

The Optimarin Ballast System is normally installed in the pump or engine room and in close proximity to the ballast pumps. The OBS can be delivered in a container, on a skid or in separate pieces to allow for easy installation in most any available space. The equipment can be installed horizontally, vertically, on or suspended below deck, along the ship's side or in several separate locations. It is relatively low weight and adds no extra noise. The OBS utilizes every square meter and does not require much space, this makes it a cost-efficient solution.



1000 M³ SYSTEM

OptiLink™

– Optimizing ballast operations



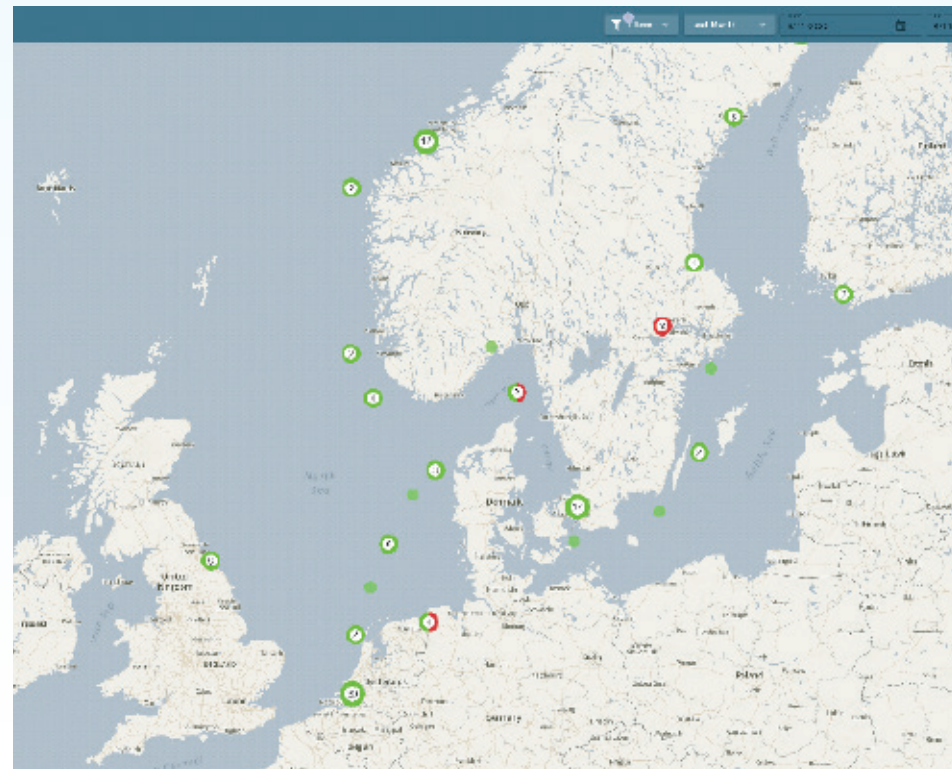
The power of the map

– Use the map to easily track the ballast operations and detect water quality challenges

The software enables the shipowner and/or crew to have online access to operational data from the system for a single vessel, and fleet performance data for several vessels.

Optimarin can provide interactive remote support to vessels reducing the need for physical service jobs, both time saving and cost effective.

A tool for optimizing ballast operations to save fuel and time



OUR CORE VALUES

PROFESSIONALISM

- We keep our promises
- We make clear demands of one another, are truthful and act with integrity
- We are solution-oriented

INTERACTION

- We work together, share our experiences and improve one another
- We communicate clearly, and give and receive constructive feedback
- We are resourceful and loyal to the decisions made

CONTINUOUS IMPROVEMENT

- We are a force for constructive change
- We learn from our mistakes
- We are humble



TAILOR-MADE

The Optimarin Ballast System is configured specifically for each customer's requirements. The systems are typically sold as component-based solutions ready for installation by the customer, since having separate components allows the greatest flexibility and relative ease of installation. Customers can also order pre-assembled skids that are ready to be installed during vessel construction or when a ship is in port.

STANDARDIZED COMPONENTS

The Optimarin Ballast System is a modular system using standardized components for all flow configurations. All UV spare parts can be used for any system capacity which provides simple procurement and logistic operation for both owners and operators of large and diverse fleets. The filters are also standardized and within a large capacity range only a few filter sizes are utilised. Our customers will have easy access to spare parts such as UV lamps, replacement filter elements, etc, supplied by our partners around the world.

EASY MAINTENANCE

The Optimarin Ballast System is based on a simple and reliable design with few movable parts which requires little or no system maintenance and ensures operational reliability. The OBS has fewer parts and UV lamps in comparison with similar systems. The patented UV chamber in CuNi, the high water flow and high UV intensity make the UV lamps and the internals of the UV chamber self-cleaning and ensures a relative long service life. A self-cleaning UV system combined with the automatic back-flushing filters results in a minimum requirement for system cleaning and maintenance for the ship's crew.

OPTIMIZING POWER CONSUMPTION

The Optimarin Ballast System is certified to adjust the power consumption according to UV intensity. The system will automatically optimize the power consumption pending UV intensity which is based on the water quality during ballasting (turbidity, etc).

SATISFIED CUSTOMERS



ARDMORE SHIPPING

Ardmore has chosen Optimarin BWTS for their fleet of product and chemical tankers in worldwide trade.



HÖEGH DETROIT

Höegh Autoliners has chosen Optimarin AS for a series of their Pure Car and Truck Carrier vessels.

- that use Optimarin Ballast System



SAGA SHIPHOLDING

Optimarin signed a fleet agreement with Saga Shipholding in 2011. Since then, Saga has installed our BWTS on its entire fleet, both newbuilds and retrofit. This adds another 34 ships to Optimarin's reference list.



TIDEWATER

The first retrofit OBS was installed in 2009 on board the North Mariner. Since then several systems have been installed on board Tidewater vessels, both retrofits and newbuilds.

AT YOUR SERVICE



We have a dedicated service engineer team in Norway with expert knowledge of the Optimarin BWTS including the control system and the interfaces with the other ship systems. In addition, we have a world-wide network of service partners standing by to assist our customers when needed.

The Ballast Water Treatment System business is moving into a new era, after the final phase of the IMO regulations became effective September 8th 2019. It is not only a requirement to have a BWTS installed on a ship, but the system must be used as well.

For Optimarin this means that our Service organization is ready and prepared to support our customers World-Wide.

OptiLearn™

Optimarin Training Academy

Training is an important part of Optimarin's service offering. Training is a key element in ensuring that dedicated crews can operate the OBS in a safe manner, and as an integral part of the ship's operations.

Introducing OptiLearn, our cloud-based platform with a comprehensive BWTS e-learning course, offered free of charge. This course aims to give users a general higher technical and functional understanding of our system, how to operate the BWTS in accordance with laws and regulations for handling of ballast water. The course also includes advice on how to act in emergency and non-compliance situations and how to routinely maintain the system in good condition. Join us to master BWTS operations and regulations through an insightful learning experience.



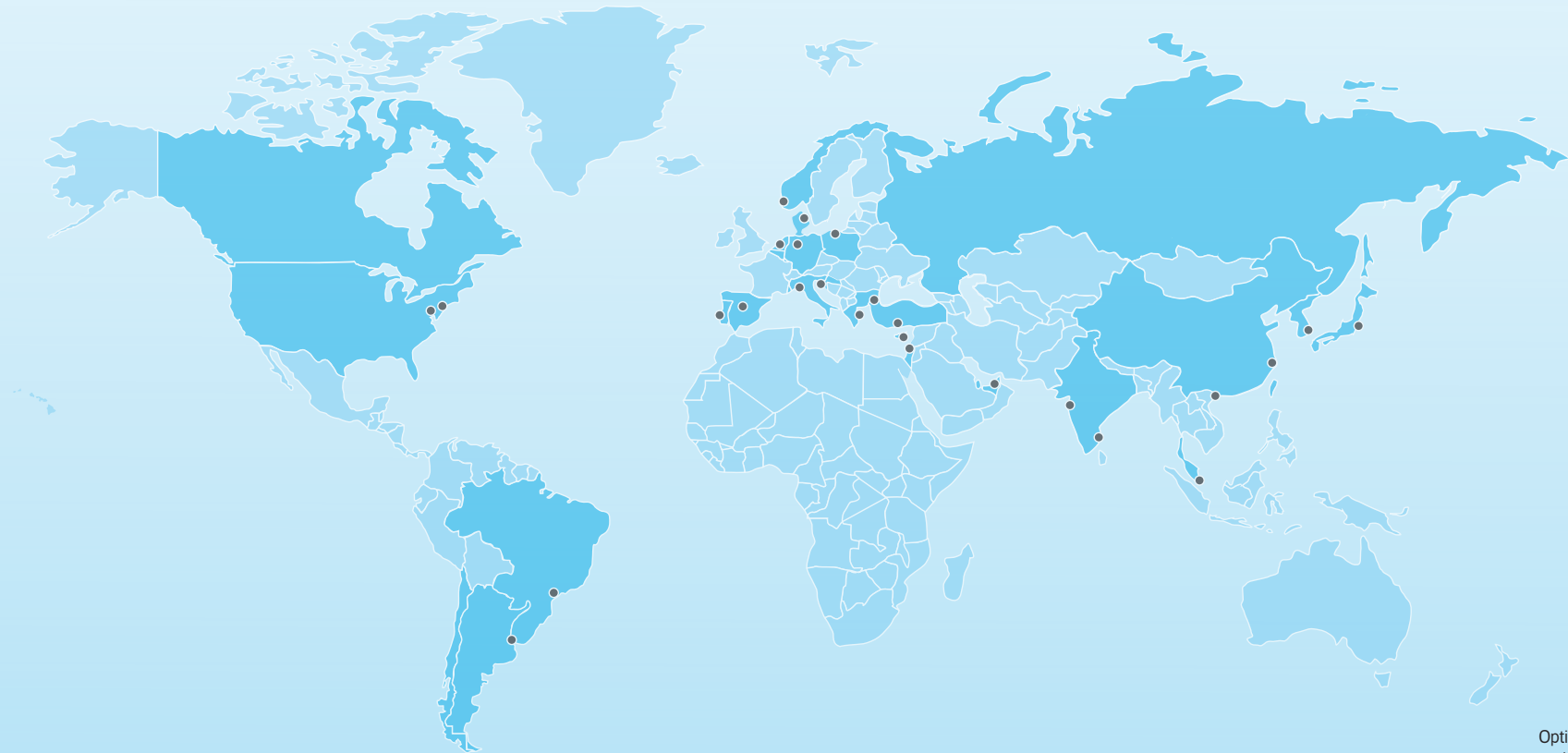
For more information contact:

training@optimarin.com

MOBILE LEARNING

With free applications for iOS and Android, learners can study when and where they want to, and even save courses to their devices to take them offline.

OPTIMARIN - all over the world



SALES OFFICES:

The Netherlands - NL
Shanghai - CN
Singapore - SG
Stamford CT - USA
Tokyo - JP
Varna - BG
Istanbul - TY

SALES AGENTS

- Argentina / Chile
- Buenos Aires
- Brazil - Sao Paulo
- China North - Dalian
- Croatia - Rijeka
- Cyprus - Nicosia
- Denmark - Fredrikshavn

- Greece - Piraeus
- Hong Kong
- India - Chennai / Mumbai
- Israel - Ashdod
- Italy - Genova
- Korea - Busan
- The Netherlands - Rotterdam
- Portugal - Turcifal

- Qatar / UAE - Sharjah
- Spain - Madrid
- Turkey - Istanbul
- USA / Canada
- West Caldwell, NJ

DISTRIBUTOR

- Zeppelin Power Systems GmbH
- Germany
 - Poland

Optimarin® is a registered trademark of Optimarin AS, Norway.

OptiLearn®, OptiSafe®, OptiClean®, OptiStrong®, OptiLink®, OptiWash® [...] refers to products manufactured, and services delivered by Optimarin AS.



OPTIMARIN AS Sjøveien 34, NO-4315 Sandnes, Norway, TEL +47 51 11 45 33, info@optimarin.com, www.optimarin.com