

# The future of **fleet operations** is here

AND WHY A CONNECTED ECDIS  
MAKES IT EASY TO GET STARTED



WHITE PAPER

# Introduction

The owners, operators and managers of today's maritime fleets find themselves confronted by a range of pressing challenges. Over capacity is leading to growing pressure to make savings without sacrificing vessel efficiency, stricter environmental and safety regulations need to be complied with and the fragmented digital technology being marketed to help meet these challenges is often seen as creating as many problems as it solves.

Staying competitive in this transforming industry means having access to actionable insights on fleet operations, squeezing more efficiency out of existing assets rather than investing in new ones and fostering a new operating culture and ways of working among crew and onshore personnel. And this all has to be done with minimal capital outlay.

There are many solutions on the market that attempt to collect, analyse and share the information needed to increase efficiency or demonstrate compliance, but most of them require investment in dedicated systems. As well as being a costly and complicated exercise, integrating these solutions often only gives access to a narrow portion of the necessary information, rather than the holistic vessel and fleet-wide views that are really needed.

A cost-effective and simple first step for collecting all the necessary data is to upgrade to an electronic chart display and information system (ECDIS). An ECDIS displays the information from electronic navigational charts and integrates GPS information from navigational sensors, radar and automatic identification system (AIS). It's the perfect hub for all the data that you already collect and need to leverage in order to meet efficiency and compliance goals.

The second step, and the one that really puts you on the road to taking full advantage of the analysis and sharing possibilities needed to maintain competitiveness, is to connect the ECDIS to the cloud. This makes it possible to use unlimited onshore computation power to share and integrate all the relevant onboard data with onshore fleet operation functions, leading to improved voyage planning, tracking and situational awareness, more robust compliance and reporting, voyage optimisation and benchmarking and enhanced asset management.

We believe that the connected ECDIS represents an easily deployable, commercially viable and future-proof foundation upon which to build the digital solutions needed to take fleet operations to the next level.

In this paper, we'll look at how a suite of interconnected modules based on a connected ECDIS, overcome common blockers to investing in digital solutions, and the benefits they bring in terms of navigational awareness, compliance and reporting, voyage optimisation and asset management.



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- Abstract geometric lines in the bottom right corner, consisting of several thin, light gray lines that intersect and form a series of triangles and polygons, creating a modern, architectural feel.





## The market landscape

The pressures to improve fleet operations are increasing every day. Over capacity of vessels means that cost effective ways to retrofit the existing fleet with solutions that improve margins are in great demand. Technology has already come a long way in helping to bring such solutions to the market, however they differ significantly in terms of how straightforward and cost-effective they are to set up, maintain and get useful benefits out of.

### The constant pressure for increased efficiency

With today's low margins, reducing operational costs, maximising the uptime of vessels and securing sustainable profitability in a volatile market are the key drivers. The most common first step in reducing operational costs is to cut fuel consumption, and this can be achieved in a number of ways, from improved route planning and real-time awareness of approaching weather or port congestion to real-time monitoring of engine condition and propulsion systems. Another way to reduce operational costs is to improve the efficiency of the processes needed to deal with the ever-increasing onboard and onshore administrative workload. This is especially useful for onboard crews as it allows them to use time for improving safety in their operations. Technology that enables condition-based maintenance, rapid delivery of the correct spare parts and optimisation of vessel operations are key to future profitability.

### A changing regulatory environment

In 2018, the IMO imposed the target of reducing greenhouse gas emissions from the total shipping fleet by at least 50 percent by 2050 from 2008 levels, with the aim of achieving full decarbonisation by the end of the century. Along the route to the 2050 requirements, there are also some challenging legislative milestones. By 2030, emissions—primarily CO<sub>2</sub>—from new and existing ships must be cut by 40 percent on average, compared to 2008 levels. In the same year, 2018, the EU introduced its European Monitoring, Reporting and Verification (EU-MRV) scheme. Complying with this legislation, and preparing to comply with the stricter targets in the future, is an immediate concern for owners, operators and managers alike and it requires new ways of reporting that simultaneously improve accuracy and reduce administrative workload.

### DETECTION OF DEPARTURE AND ARRIVAL PORT

EU MRV requires all entries and exits at EU ports to be listed.



### FUEL MEASUREMENT

For real-time insights on consumption rates, fuel measurement should be either carried out by regular tank soundings or using fuel mass flow meters on all combustion equipment.



### DETECTION OF FUEL TYPE

The reporting system needs to connect fuel bunkered with fuel consumed on the Bunker delivery note level.

When proper fuel mass flow meters are used on liquid fuel, the fuel type can sometimes be detected by the specific mass.



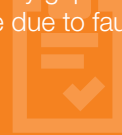
### USER MANAGEMENT AND AUTHENTICATION

The primary user(s) can be anybody in the customer organisation who is responsible for EU MRV reporting.



### CHECKING/EDITING OF RECORDS

To ensure accuracy it should be possible to preview all figures, with the option to fill in any gaps in the data, for example due to faulty sensors.



### DATABASES

All data included should be kept in a separate tamper-free database, including identification and IMO number for verification.



### REPORTING

At the request of the user, the service should allow the export of data, for example a selected voyage or an annual report of all parameters.



### SECURITY

The transfer of data should typically be highly compressed and encrypted in order to minimise transfer costs and ensure security.



### THIRD-PARTY ASSESSMENTS

For maximum quality and compliance with EU MRV, best practice for any system and services includes assessment by an independent third party.



## Mature technologies already exist

With Maritime VSAT, the expansion, reliable and affordable satellite connectivity, 24/7 connectivity for ships at sea is becoming a reality, enabling the continuous flow of data between vessel and shoreside systems.

Ship sensors already collect a wealth of data, and existing required onboard hardware—such as the vessel's ECDIS—can act as a data aggregator and hub. However, merely having the data is not sufficient. Making sense out of it requires smart tools to filter, process and analyse the data to help you draw the right conclusions and make the right decisions. Big Data analytics, with its ability to detect anomalies.

Tools based on cloud computation offer an efficient and secure way to intelligently route information to machine learning applications that can add real value through modelling the data—for example fuel-flow modelling—and suggesting safety and efficiency improvements. Big Data analytics can detect anomalies in data received from the sensors and these can then be made transparent via notifications both onboard and onshore through fixed dashboards and mobile devices such as tablets.



# Common blockers to investing in digital solutions

WHILE THE NEED FOR NEW DIGITAL SOLUTIONS IS CLEARLY THERE, AND MOST OF THE TECHNOLOGY IS ALREADY AVAILABLE, THE MARITIME INDUSTRY HAS BEEN UNDERSTANDABLY CAUTIOUS ABOUT THE SAFETY AND COSTS IMPLICATIONS. UNLOCKING THE POTENTIAL OF DIGITAL TECHNOLOGY REQUIRES AN APPROACH THAT SATISFIES BOTH OF THESE CONCERNS.

## Fragmented, incompatible solutions

A major challenge has been the difficulty in finding a business case to support the investment needed. The fragmented nature of the maritime digital solution market means multiple players make single systems that do one thing (and may do it very well) but expanding from there is difficult if not impossible.

As the solutions are not mutually compatible it leads to multiple data silos as more onboard systems are added, increasing rather than reducing complexity. The solutions are often not linked to real-life operations or a specific business goal, such as regulatory compliance, safer operations, more transparent reporting or more efficient asset management. This makes it hard to see any concrete benefits and hence define a compelling and immediate business case.

A solution that easily interfaces with existing hardware like the ECDIS, minimises any upfront investment and risk, removing this barrier. A service-based modular solution allows for experimentation with mutually compatible digital solutions without the need for any major integration projects. You can start off with a module to meet one objective and expand at your own pace to help shipowners to transition towards smarter marine operations in a phased and profitable manner.



## Cyber security worries

With vessels increasingly using systems that rely on digitalisation, integration and automation, marine cyber security risk management is a growing and justified concern. There is also a regulatory aspect to this. As the IMO has recognised that cyber security is becoming critical for data protection and reliable and safe marine operations, from January 2021, it requires that cyber security be addressed in safety management systems. In 2017, the IMO adopted resolution MSC.428(98) on Maritime Cyber Risk Management in Safety Management Systems (SMS). Any digital systems should have a robust cyber security framework based on best practices and guidelines to ensure the security of operations.



# Key guidelines for marine cyber security

- ✓ BIMCO: Guidelines on Cyber Security Onboard Ships
- ✓ ABS: Guidance notes on the Application of Cybersecurity Principles to Marine and Offshore Operations
- ✓ DNVGL: Recommended Practice for Cyber Security Resilience Management
- ✓ IMO MSC-FAL.1: Guidelines on Maritime Cyber Risk Management
- ✓ IMO MSC.428(98): Maritime Cyber Risk Management in Safety Management Systems
- ✓ IET: Code of Practice, Cyber Security for Ships

BIMCO

ABS

DNV-GL



IET

In addition, it's important to realise that maintaining cyber resilience is a continuous process that should never be thought of as completed. Your solution provider should have a cyber security approach that relies on industry best practices to safeguard their products and service operations throughout their lifecycle and help you to develop the resilience required to defend against and recover from any form of cyber interference. Look for a provider that can help you:

- Identify cyber risks and understand the actions needed to mitigate them
- Maintain an auditable and managed program to control cyber security threats
- Ensure preventative protection of your installation against cyber risks and safeguard products and service operations
- Recover quickly and maintain resilience to ensure maximum operational uptime and availability while increasing the reliability of your industrial control system assets

## Cyber security

CYBER SECURITY IS A PRIORITY FOR EVERY OPERATION IN THE WORLD, MARINE OR OTHERWISE

A Wärtsilä cyber secure solution facilitates your ability to keep your data and your connected systems secure, both ashore and onboard, through the cloud services we offer.

### SOPHISTICATED SECURITY COMPLIANT CLOUD PLATFORM

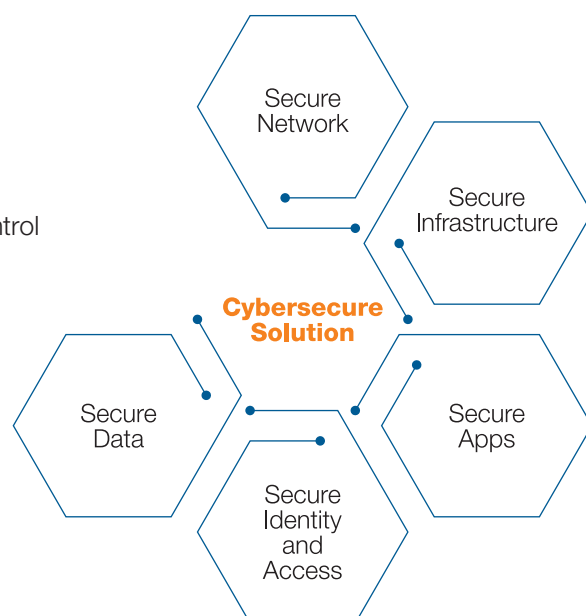
- ✓ Identity control
- ✓ Secure infrastructure
- ✓ Security applications
- ✓ Compliant to the General Data Protection Regulation (GDPR)
- ✓ VPN
- ✓ Firewall IEC 61162-460 standard certified

### LAN BUSINESS SEGMENTATION

- ✓ Business and private network segmentation with the traffic priority control

### DATA SECURITY VALIDATION

- ✓ Data integrity and validity checks



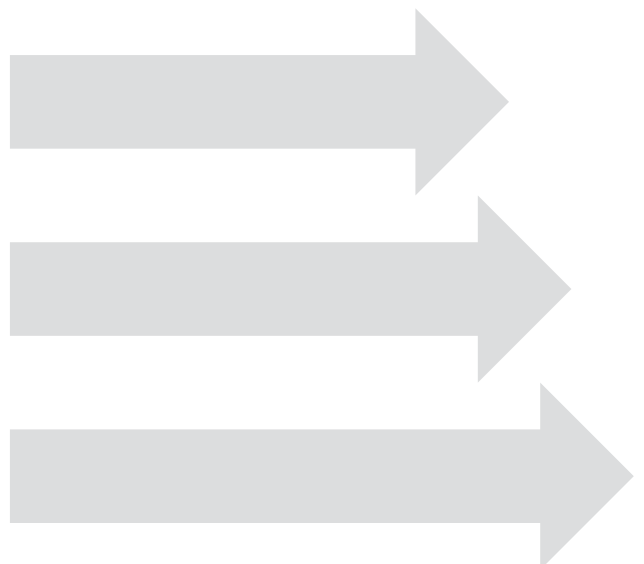
# The benefits of digital solutions in the maritime industry



## The starting point: connected vessels and operations

The first benefit of a connected ECDIS, and one that applies to all maritime operations, is increased transparency. All relevant information is available simultaneously to the key stakeholders, both onboard and onshore, meaning everybody can see the same data at the same time. This is the basic enabler of efforts to improve safety, efficiency and compliance. Instead of a single data point in a noon report, real-time data from a range of sources allows operators to use digital tools to benchmark operations across the fleet, take action where needed and optimise an individual vessel's operations. It can also be used to improve behaviour and focus training efforts, improve processes and eliminate human error.

**IN THE FOLLOWING SECTION WE EXPLORE FURTHER BENEFITS THAT TAKING THIS SMALL INITIAL STEP CAN OPEN UP**





## Onboard voyage planning

- Plan routes based on up-to-date navigational charts to follow a route that is definitely safe to sail
- Conduct a full route optimisation, taking into account weather, currents and vessel-specific power demands and consumption
- Receive all necessary charts and data for the next voyage automatically
- Prepare an automated voyage plan that still allows officers to fine-tune the route if needed
- Maintain an optimised route throughout the voyage
- Share the route and voyage data in real time with other stakeholders
- Reduce route planning time from four to five hours to just 30 minutes and eliminate human error

Navigational data onboard needs to be up to date but traditionally the data source is ashore, for example in hydrographical offices. By combining the advantages of a connected ECDIS and automated data delivery into a simple and fast voyage planning tool the cumbersome and fault prone process of getting new chart information into the onboard decision tool can be eliminated. It can be replaced with an automatic, streamlined and user-friendly solution that not only ensures the latest charts and voyage data are always at hand but also reduces typical route planning time from four or five hours to just thirty minutes.

Voyage planning can be completed automatically on up-to-date nautical charts following a clear step-by-step approach from port to port, after which the computer gives a draft route that is safe to sail. The shortest navigation route can be calculated based on the specific ship's dimensions, hydrodynamics, 3D global bathymetry and navigational information as well as restricted-area and customer-defined parameters.

The route can then be weather optimised—further improving the safety and fuel efficiency—and fine-tuned on the waypoint and leg level, while keeping the master in full control of the planning. All the necessary—and no unnecessary—charts are automatically downloaded and put along the route, which can be easily adjusted with flexible, fast and user-friendly route manual correction tools.

As the data is automatically combined with information from other sources (TADS/AVCS ENC's, ENP, ADP, IMO and weather reports), vessels can have Google Maps-like access to real-time charts and navigational data, enriched with additional information like weather, traffic data and alternate route suggestions. This means that in addition to always having up-to-date charts, the system can recommend the safest route based on weather and other navigational hazards and also show the effects of choices made on fuel consumption and estimated time of arrival in port. It also means that you no longer have to worry about buying, distributing and licensing charts.





# Tracking and situational awareness



- Increased awareness of navigational hazards
- Improvement of ship-shore communication
- Increased efficiency of shore-based processes

Creating situational awareness is a result of combining information from what's happening onboard with information about the vessel's environment, such as weather data and sea state. Then, by applying intelligent analytics based on machine learning methodologies, one can move beyond answering the question "What happened a few hours ago?" to "What's happening now?"—and ultimately, "What will most likely happen in the future?" This enables a completely different, higher level of operational situational awareness that is the basis for all the hands-on situational-awareness solutions.

A connected ECDIS provides centralised access to the voyage data, real-time ship-to-shore communication and reporting on fleet operation KPIs, that enables more transparent and efficient shore-based processes and enhanced situational awareness regarding

navigational hazards. During a voyage it can track the ship along its route and enable features such as play-back and play-ahead. It can enable various chart backgrounds and overlays, provide zone management and notifications, for example when entering or leaving a MARPOL or ECA zone, and navigational notifications of safety relevant issues. It provides decision support notifications on safety and efficiency and gives 20–30 minute traffic forecast and manoeuvre prediction.

In case of claims, having access to this information is also vital as it allows a virtual playback of what happened during any incident.

## Easier compliance and reporting

- Increase process efficiency with streamlined error-proof reporting
- Lower risk of regulatory and stakeholder claims
- Build a common data set for increased transparency



Ensuring environmental and charter party compliance is another key area where a connected ECDIS and the digital solutions it enables can bring enormous benefits.


The ability to send real-time, relevant nautical data—such as planned route, position, heading, speed, weather and often RPM—throughout the voyage eases traditional noon reporting by enabling pre-filled reports to which only a few additional parameters, such as fuel consumption, need to be added. Automated IMO DCS, EU MRV and charter party voyage compliance reports can also be generated. The data can also be viewed by the onshore support team for real-time vessel monitoring and post-voyage analytics that can help optimise vessel and fleet operations. This approach has the added value of removing human error from reports and frees up crew time to focus on other tasks.

All chartered vessels need to fulfil contractual requirements regarding their performance in terms of speed and fuel consumption and typically fixed consumption limits for port stays. Early notifications can be sent if the charter party conditions are not being met, while end-of-voyage reports summarise the commercial performance throughout the voyage according to the specific charter party conditions. Digital reporting services can also help charterers meet contractual requirements and ensure compliance with environmental regulations. The end result is greater transparency for all parties involved.





## Voyage optimisation and benchmarking

- 
- Lower operational cost
  - Increase process efficiency
  - Gain transparency on fuel efficiency
  - Increase charter market attractiveness
  - Satisfy operator requirements
  - Connect seamlessly to onboard system

The digital solutions enabled by a connected ECDIS can improve all aspects of voyage planning, optimisation and analysis. As described above, planning the safest, most fuel-efficient route is much more accurate and less time consuming when performed using the most up-to-date automatically downloaded charts.

The connected ECDIS also gives onboard and onshore teams a common view of the same data at the same time, which improves real-time monitoring, analysis and notifications on parameters such as route and speed execution during a voyage. Post-voyage analysis, including fuel consumption breakdown, speed and route excess costs, as well as monthly/quarterly voyage KPI benchmarking is also made much simpler.

Beyond individual vessel journeys, a connected ECDIS ultimately provides tools to create a coordinated, global approach to maritime traffic control, monitoring and decision support—a ship-traffic control model similar to the one used by the aviation industry.

For example, 30 % of all bulkers trading are waiting at any point in time—leading to higher fuel consumption and costs, increased emissions and congestion at ports. Digital solutions that enable real-time tracking of the fleet, along with integration with ports and fleet systems, mean will soon dramatically reduce that figure.



## Port connectivity

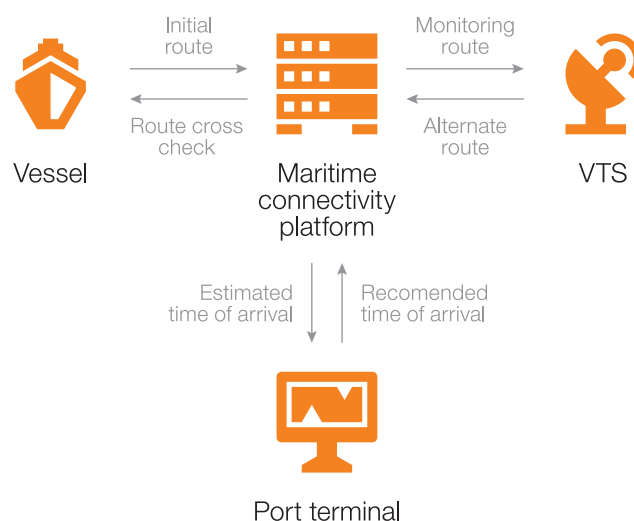
- Increase fuel efficiency by just-in-time arrival
- Improve stakeholder coordination in port
- Improve safety in dense traffic areas



A connected ECDIS is the foundation of more efficient information exchange between vessels and ports. One of the primary benefits of this is to facilitate just-in-time arrival, with operators adjusting speed as needed to arrive only when there is an available berth. For vessel operators this can mean fuel savings and reduced emissions, and for terminal operators and port authorities it can result in lower traffic congestion by reducing anchorage time.

Just-in-time arrival makes operations more efficient. Currently communication still happens through emails and sometimes even fax, but a connected ECDIS speeds up communication and reduces errors. With an ECDIS-based ship-to-shore exchange platform a vessel's estimated time of arrival can adapt to real-time operational conditions. For example, a vessel can slow steam later than planned to save fuel and reduce anchorage time.

Ports, the first of which are already joining open-standard protocols, will also be able to reduce congestion and ensure lower emissions, better plan and allocate their resources and make themselves more attractive by offering extra services to improve vessel competitiveness.



**VOYAGE AND PORT INFORMATION SERVICES**

## Improved asset efficiency



- **Save fuel and price vessels correctly**
- **Lower maintenance efforts with better scheduling**
- **Identify areas of improvement and choose the investment with the best ROI**

Data from onboard sensors, combined through a connected ECDIS with analytics and automated reporting, provides information into how well assets are performing both in real-time and over the longer term. Insights into hull and propeller condition, speed fuel curves, and engine performance also enable improvements in energy efficiency and associated fuel costs and make correct vessel pricing easier. For example, hull fouling can be tracked through vessel performance, allowing cleanings to be scheduled only when needed.

From a maintenance perspective, regular data from onboard systems, combined with analysis, paves the way for condition-based maintenance (CBM). In this model, maintenance is carried out as needed based on KPIs instead of on fixed schedules, lowering costs, increasing

availability and improving asset performance so owners receive a better return on investment and operators see increased profits and better-maintained assets.

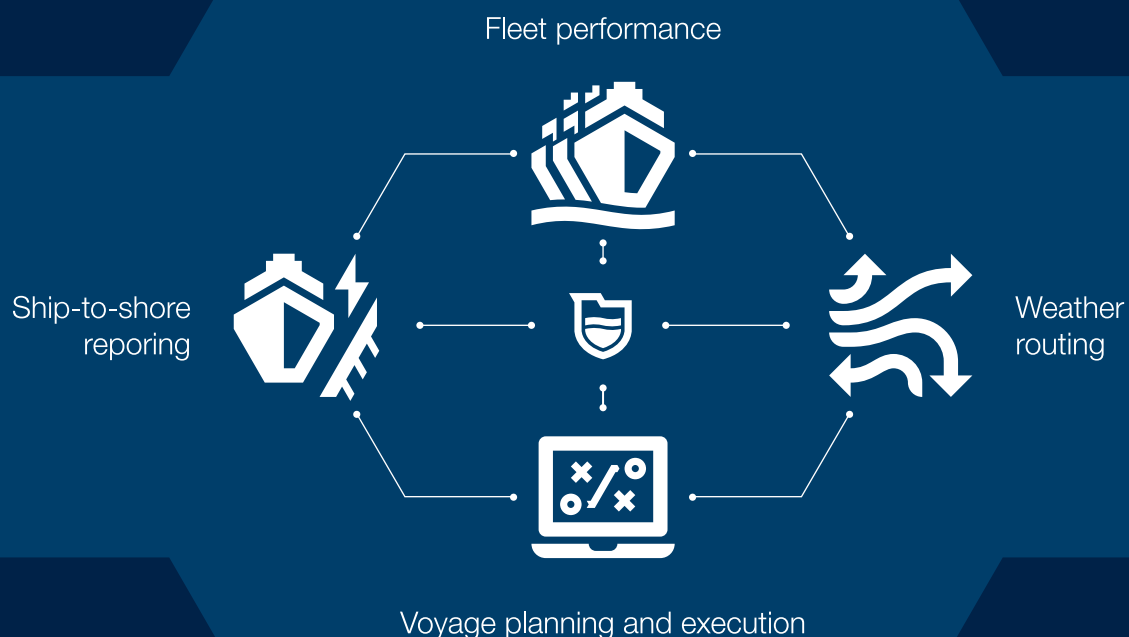
In addition to condition-based maintenance, a connected ECDIS also enables remote maintenance and support. Requests from crew working with data, make up a large proportion of calls to most support centres and these calls typically take time to resolve. Connecting the ECDIS is the first step in remote identification of the cause of any issue. And because the support centre has full insight into equipment health, it makes ordering the right spare parts much quicker and frees up crews to spend more time on what they are actually supposed to be doing. It also enables remote software updates and patching.





# Wärtsilä's Fleet Operations Solution

Wärtsilä has developed a fully integrated network for ship-to-shore communication based on the connected ECDIS. By connecting the ECDIS to our cloud-based Fleet Operations Solutions (FOS), personnel can reap the benefits of a fully transparent navigational infrastructure and intelligent automation that takes efficiency, safety, equipment maintenance and operational processes to new heights.



## WÄRTSILÄ FLEET OPERATIONS SOLUTIONS IS:

- Integrated—a single unified solution that is built on existing vessel hardware
- Modular—choose only the parts of the solution that are needed
- Scalable—grow the solution easily
- Route planning happens on the latest nautical charts resulting in a route always safe to sail
- Built-in weather optimisation to find safe and most fuel-efficient route
- Data and charts are automatically delivered, no ordering, no USB
- SmartLog allows ship-to-shore reporting with most data already pre-filled
- A mobile tablet on board is used for SmartLog and “Take me home” ECDIS backup
- Real-time vessel and fleet tracking (no AIS holes)
- Advanced fuel efficiency algorithms to spot more difficult saving levers

FLEET OPERATIONS SOLUTION CONSISTS OF FLEXIBLY SELECTABLE PLUG-AND-PLAY MODULES THAT CAN BE COMBINED FOR EACH SHIPPING COMPANY'S NEEDS



The modules can support a single travelling superintendent with a tailored mobile app or run a full fleet operations centre. The full solution is notification driven, with users receiving alerts about the navigational, vessel performance, data quality or maintenance issues they have chosen.



## BRIDGE MODULE AND TABLET APPLICATION

This portable device on the bridge serves as a central resource for decision support, automatic reporting and ship/shore communication. It is a “take me home”/back up ECDIS solution that holds our SmartLog data collection tool with extensive reporting and log functionality including automatic pre-filling. It provides decision support notifications on safety and efficiency and gives 20—30 minute traffic forecast and manoeuvre prediction.



## RADAR

Navi-Radar, a modern S-band and X-band radar is a standard on many vessels worldwide.



## ROUTE PLANNING STATION

Navi-Planner is a type-approved, cyber-secure system that forms the central onboard hub for voyage planning, route optimisation, charts and data delivery as well as data collection. It can run next to all ECDIS types or as an integral part of the Wärtsilä ECDIS by Transas. It significantly reduces the manual effort of onboard voyage planning process (from four to five hours to 30 minutes).

Voyage planning is completed automatically on up-to-date nautical charts after which the computer gives a draft route that is safe to sail. The route is then weather optimised—further improving the safety and fuel efficiency of the route. All the necessary (and no unnecessary) charts are automatically downloaded and put along the route, which can be easily adjusted with flexible, fast and user-friendly route manual correction tools.



## ECDIS

The Wärtsilä Navi-Sailor ECDIS by Transas is the industry-leading ECDIS and is used by 35 % of the world fleet and delivers proven usability. The data control unit enables a connection between the navigation system and data sensors, working with the integrated onboard data processing and storage solution.

The built-in telemetric sensor provides smart collection of dynamic motion parameters for extended diagnostics and behaviour analytical services.



## COMMUNICATION LINK

The connected ECDIS allows a new world of functionalities. We use the existing V-SAT or Fleet Broadband on the vessel but also supply integrated communication packages as part of Fleet Operations Solutions.



## CHARTS, PUBLICATIONS AND WEATHER

With this module automatic data delivery keeps charts and planning tools updated and therefore compliant. It provides the easiest possible way to receive official charts and data for the voyage and means relevant information is always available on the bridge. All charts and publications (TADS/AVCS and ENC's, ENP, ADPs, IMO-Publications and tide tables) as well as always up-to-date weather forecast are included in the module.



# FOS modules for onshore fleet operations centre



## TRACKING AND NAVIGATIONAL AWARENESS

This is the default module and improves transparency by increasing awareness of navigational hazards, improves ship-to-shore communications and increases the efficiency of onshore processes. It enables a real-time view of the fleet's positions, a vessel's planned route and deviations from it, nautical notifications, near misses, incident play back and immediate situational overview for the onshore team.



## COMPLIANCE AND REPORTING

The compliance and reporting module increases process efficiency by automatically generating reports—for example a prepopulated MRV report based on noon-report and ECDIS data—which saves the crew's time and reduces errors. Higher quality reports reduce the risk of regulatory or stakeholder claims and allow the creation of a common data set for increased transparency and fleet-wide comparison.



## VOYAGE OPTIMISATION AND BENCHMARKING

Gain better transparency over fuel efficiency, lower your operational costs and increase your charter market appeal with the voyage optimisation and benchmarking module. Plan the best route, speed profile and energy forecast; execute real-time analysis and get route/speed notifications and receive powerful post-voyage insights on fuel consumption, excess speed and route costs as well as monthly/quarterly voyage KPI benchmarking.



## HULL & ENGINE

This module optimises asset efficiency for both operators and owners. For operators it enables fuel savings, reduced maintenance frequency and cost and the identification of areas of improvement. For owners it makes pricing vessels correctly much easier, improves maintenance scheduling and identifies the investments with the best return on investment.

Speed/fuel curves can be easily generated for different loads and weather conditions to enable better vessel performance benchmarking. Propulsion (hull and propeller) and engine performance tracking can be applied at both vessel and fleet level.

## Holistic Support



### TRAINING

Online and remote training options for type specific trainings for Wartsila x Transas equipment.



### MAINTENANCE

Remote Maintenance from our network operations center prevents failure, allows online problem solving and reduced service engineer needs onboard.

## Concrete benefits for every onshore stakeholder

	Tracking and awareness	Compliance and reporting	Voyage and ports	Asset management
OWNERS	Help ensure the safety of your vessels with up-to-date digital navigation with the ability to integrate the latest weather and other third-party information. Ensure charter party compliance with real-time data about the vessel.	Ensure and demonstrate that your assets are compliant with environmental and other regulations.	Ensure that your assets are being utilised efficiently and not waiting in port.	Ensure your assets are as competitive as possible to attract charterers and save costs related to maintenance.
SHIP MANAGERS	Help ensure the safety of a vessel at sea with up-to-date digital navigation with the ability to integrate the latest weather and other third-party information.	Ensure compliance through accurate data and reporting, which is key for achieving a vessel's certification. Streamline reporting with digital tools and sent to multiple stakeholders, reducing workload and errors.	Measure how a vessel is performing according to requirements.	Understand how a vessel is performing and perform targeted and predictive maintenance to ensure smooth operation and maximum availability.
OPERATORS	Follow the vessel with real-time data and quickly act upon any deviation (e.g. weather-related changes).	Receive alerts on charter party compliance issues.	Reduce fuel consumption on the voyage. Enable new tools for improving voyage efficiency, such as just-in-time arrival.	Reduce fuel consumption by getting insights into how well the assets you are operating are maintained.

# Getting started with digitalisation initiatives

## Minimise investment

The best solution to the challenge of creating a compelling business case is to ensure minimal CAPEX by removing the need for investment in hardware, allowing experimentation with digital solutions at minimal risk. Wärtsilä's FOS leverages existing hardware that acts as a central data aggregator and hub thereby removing the need for large upfront investment. From there, a modular service model allows the rolling out of digital solutions as different use cases are identified.

## Find a trusted partner

Creating the tools to collect, store, process and enrich data in a way that is useful is a large undertaking that requires a considerable investment of time and resources. By relying on a trusted partner, shipping companies can get all the benefits while minimising costs and remaining focused on their core tasks.

## Ensure your solution can expand as needed

While single systems may do one thing well, concerns around incompatibility with other existing and future systems, obsolescence, the burden of training crew and lack of standardisation mean integrating and expanding digital services from this base can be costly, difficult, or even impossible. Using modular, mutually compatible solutions is a key benefit as it allows expansion into new areas as and when new use cases are developed without having to start from scratch with a different solution.



## Update ways of working

Moving from more traditional operations to using digital solutions in daily work requires a shift in mindset and the adoption of new processes across the organisation. The roles of onshore and onboard personnel will change when most data processing and decision making is done in the cloud but it's important to emphasise that this will strengthen their roles, not make them obsolete. Rolling out new solutions requires bespoke training in order to ensure buy-in from all stakeholders. Commitment from leadership is key in this area—it will be up to management to help set out the vision and guide the process of both choosing a solution and changing roles to ensure successful uptake of digital solutions.

It is important to realise that as well as making daily work and processes easier for existing personnel, enabling forward-looking digital solutions will also make it easier to attract and retain new employees at a time when securing new onboard talent may be challenging.

## A glimpse into the future—Wärtsilä is leading the Smart Marine Ecosystem

Wärtsilä is at the forefront of harnessing the changes taking place in the shipping industry to deliver value and optimisation for its customers. By orchestrating these developments through the use of high levels of connectivity and digitalisation, Wärtsilä intends to lead the industry's transformation towards a Smart Marine Ecosystem.

Smart Marine is about ensuring that the industry can work together to take up critical business and environmental challenges and collaborate towards solutions that will achieve a sustainable shipping future. To this end, Wärtsilä provides interfacing energy, asset and voyage management systems that reduce emissions, increase safety and improve operational efficiency across the lifetime of our customers assets.

The Smart Marine ecosystem will see not only the marriage of hardware and software, but business and IT infrastructures merging to become one, with mass movement to the cloud. We're getting smart with navigation to bring efficiencies that greatly add to the bottom-line, reduce climate impact and improve safety. By combining bridge infrastructure, cloud data management, data services, decision support tools and access to real-time information, we can enable data sharing with the regulated live systems of the vessel. These types of voyage solutions can be retrofitted to existing vessels, helping shipowners to transition towards smarter marine operations in a phased and profitable manner.



# Let's talk about the future of your fleet operations management—it's here today!



**Torsten Büssow**

Director

[torsten.bussow@wartsila.com](mailto:torsten.bussow@wartsila.com)

Wärtsilä Voyage Solutions, Transas



**Alex van Knotsenborg**

Director Global Sales

[alex.vanknotsenborg@wartsila.com](mailto:alex.vanknotsenborg@wartsila.com)

Wärtsilä Voyage Solutions, Transas

Wärtsilä is a global leader in smart technologies and complete lifecycle solutions for the marine and energy markets. By emphasising sustainable innovation, total efficiency and data analytics, Wärtsilä maximises the environmental and economic performance of the vessels and power plants of its customers.

[wartsila.com](http://wartsila.com)

