

# HANSA



INTERNATIONAL MARITIME JOURNAL

12|2017

## SCHIFFFAHRT

MPP-Report  
Interview Hespont  
MSC denkt neu

## SCHIFFSTECHNIK

Neue Fähr-Katamarane  
»Digital Awareness«  
Sieger-Beitrag HIPER

## HÄFEN

Multimodalität  
Interview UVHH  
Ausbau in Göteborg



Dezember 2017 | 154. Jahrgang  
ISSN 0017-7504 | C 3503 E | € 14,80

[www.hansa-online.de](http://www.hansa-online.de)

# UM- SCHLAG- BAR

HAMBURG

POZNAN

WARSAWA

CESKA  
TREBOVA

PRAHA

KOSICE

DUNAJSKA  
STREDA

BUDAPEST

KREMS

HLA

# Technology is ready for EU MRV

The entry into force of the EU's emissions reporting and verification scheme is only weeks away. The market already offers a range of compliant sensors, data processing and evaluation technologies. A few of the most recent developments



# Measurement Technology

The collection and reporting of voyage data will become a mandatory requirement from 1 January 2018, when owners of vessels over 5000 gross tonnes that call at European Union ports for commercial purposes will have to monitor, report and verify their fuel consumption and CO<sub>2</sub> emissions on all voyages, as well as emissions while at berth. Additional required information includes distance travelled, time spent at sea, details of the cargo carried, transport work, and average energy efficiency expressed in fuel consumption or carbon emissions per distance or per transport work.

In addition, the IMO has outlined a roadmap through to 2023 which is focused on developing a comprehensive strategy for the reduction of GHG emissions from shipping. In April 2015, the IMO's Marine Environment Protection Committee (MEPC) agreed to mandatory requirements for ships to record and report data on their fuel consumption. At MEPC70 in October 2016, it was decided that these requirements would be adopted as modifications to MARPOL Annex VI.

The last months have seen a number of developments on the area of sensor technology and data processing to offer regulation-ready instruments in time.

## Propulsion-based monitoring

Remote marine data monitoring company, Azurtane, has developed a new exhaust gas sensor technology for sustainable shipping to address the needs of shipowners and shipping industry regulators world-wide. The development was supported by the UK government under the Innovate UK programme.

In 2013, Azurtane began trialling its recently developed exhaust gas sensing equipment with Southampton-based ferry company, Red Funnel. The project involved second-by-second measurement of the fuel used on each voyage of the Red Jet 4 Hi-Speed ferry service between Southampton and Cowes. The fuel measurements uncovered massive variations in fuel consumption which were discovered to be due to the way in which the vessel was »driven«. Red Funnel adopted Azurtane's technology and, as a result, reduced fuel consumption by up to 15% per day.

The latest addition to the Red Funnel fleet has been made ready to utilise the same Azurtane technology to allow both the master and the Red Funnel office to monitor fuel consumption in real time and make adjustments. The company uses its exhaust gas sensors installed on ships to transmit measurements back to Southampton. The data is converted into useable management information for ship operators and the ship's officers on board the transmitting ship. This information can pinpoint noncompliance with pollution regulations, identify the actions that need to be taken, compare voyage-by-voyage energy consumption and ascertain the adjustments required to improve efficiency.

»Until now ships have been sailing blind,« Azurtane's chief scientist, Henryk Herman, explains. »Big Data can either be seen as the latest management gimmick or be used to identify trends and patterns in inefficiencies in a sea of conflicting and confusing external factors.«



WE ARE ON BOARD  
WITH EXPERTISE.

Reliability from mast  
to bilge.

LARGE ENGINE  
COMPONENTS



INDUSTRIAL  
THERMAL SYSTEMS



Because nothing can go wrong at sea, many components such as engines, hydraulics and lubrication systems as well as thermal management systems must work together reliably.

To this end, we have combined our systems competence for

marine technology—for uncompromisingly clean performance. MAHLE's high-quality and extremely reliable engine components such as pistons, piston pins and rings, cylinder liners and valve train systems are the driving force for powerful diesel engines. Wherever there is a need for efficient and safe cooling, we are able to offer leading thermal management systems and heat exchangers.

We drive your success. Worldwide.

With performance, precision, and passion.

[www.mahle.com](http://www.mahle.com)

**MARINTEC**  
HALL N2  
BOOTH N2D41-12

**MAHLE**

Driven by performance

## Automated compliance

VAF Instruments' efficiency reporting system IVY enables automated compliance with EU MRV and IMO DCS regulations. Emission verification company Verifavia has now certified the IVY Propulsion Performance Management system against the European Union's (EU) Monitoring Reporting and Verification (MRV) regulation requirements.

According to VAF Instruments, the system has been designed to automatically monitor and report voyages, it streamlines both the EU MRV and IMO DCS compliance processes for fleet managers, ship owners, and operators. In addition, it provides insights into the performance of a ship's hull, its propeller, and engine, which ship owners can translate into savings on their vessel operations.

With inbuilt sensors and fuel oil flow meters, the IVY system conducts several cross-checks for advanced performance analysis, ensuring accurate fuel oil consumption data is obtained. Ships equipped with the full system will be able to achieve compliance with minimal manual action required.

Over the years, VAF Instruments has developed algorithms capable of automatically interpreting »Big Data« to create Key Performance Indicators (KPIs) on which decisions for ship performance optimisation can be based. The Performance Management solution by IVY – which is based on measuring the thrust of a ship's propeller – includes the automatically performed enrichment of Big Data.

## Upgraded fuel management

Royston has upgraded its »enginei« fuel management system to include low-cost emissions monitoring capability to calculate and analyse vessel emissions. The technology captures key engine performance data, engine and fuel specification and flow rates, which it uses to calculate a range of emissions measurements. No exhaust gas analyser is required to do this.

SO<sub>x</sub> and CO<sub>2</sub> can be calculated from looking at the adjusted fuel consumption and air mass flow alongside combustion efficiency. SO<sub>x</sub> levels can then be advised and predicted to assist with decisions in fuel switching when entering and leaving Emission Control Areas.

NO<sub>x</sub> emissions can be calculated using the carbon balance method, which refers to the NO<sub>x</sub> Technical Code MEPC 177 (58), statistical algorithms and en-



Photo: Rolls-Royce

Rolls-Royce has launched a cloud-based fuel and CO<sub>2</sub> monitoring module

gine test data. This can be combined with torque, RPM and other engine and fuel data to ascertain the specific NO<sub>x</sub> emissions factors to be calculated from comparison with regulations from the IMO.

The upgraded enginei system also provides information on combustion efficiency to help understand the relationship between engine power, fuel consumption and engine speed.

The data obtained is automatically generated into daily reports that can be accessed by touchscreen monitors on the bridge and the engine room, showing key aspects of vessel performance criteria. Remote data sharing is possible to enable onshore management to access the information through a secure online portal and web dashboard. Computer generated charts, graphs and Google maps are used to show the complete operational profile of a vessel. 24/7 remote access is also available.

## Monitoring in the cloud

Rolls-Royce has extended its marine Energy Management solutions with a cloud-based fuel consumption and carbon dioxide monitoring module designed to help shipowners meet the European Union's Monitoring, Reporting and Verification (MRV) regulation.

With the new module as an add-on solution to the Rolls-Royce Energy Management System launched in May, data can be sent automatically from the ship to the cloud, where information and reports can be accessed and downloaded from anywhere with an internet connection. The software also validates incoming data. »With shipowners able to constantly track accurate fuel consumption and emissions data, they can reduce fuel costs and mitigate against non-compliance and any financial penalties imposed by member states,« Bjørn Kåre Myskja, Rolls-Royce, UX/Developer Engineer, Digital & Systems, says. In addition to data collection simplicity, a key focus during the software development phase was data protection. Eivind Vinje, Rolls-Royce, Technical Product

Manager – Energy Management, added: »System security and integrity has been increased four-fold, with state-of-the-art encryption technologies, a two-step verification process and a 24/7 security centre. We also invited a number of third party cyber security experts to hack into the system, but all failed to breach the protocols or find any weak spots.«

While the Energy Management EU-MRV Module is an invaluable tool for those with operations in the European Union, the system is future-proofed to meet anticipated global requirements. China has similar reporting mechanisms in place, with the International Maritime Organisation's data collection requirements entering into force in January 2019. This requires the collection of fuel consumption data per fuel type, but not CO<sub>2</sub> emissions directly. The software has been verified by the Norway-accredited MRV verifier Ecoxy.

## A start-up joins the game

Start-up company We4Sea has also developed a cloud platform that offers advanced solutions to optimize the performance and reduce fuel consumption and emissions of seagoing ships. We4Sea collects vast amounts of operational data of a ship, such as position, speed, heading and engine data. This data is sent to shore, where it is enriched with other data sources, such as weather conditions, wave heights, currents and wind. The proprietary algorithms and energy models of We4Sea transform this big data pool into actionable management information on how to optimize the use and configuration of a ship. According to We4Sea, they have proven in pilot projects that using data analysis can substantially cut fuel costs, up to 20%.

We4Sea recently launched a new software module in response to the European emission monitoring regulations for ships. The company's MRV module has been intensively reviewed by Verifavia.

Using We4Sea's MRV module, all MRV required data is captured within standard vessel forms as part of the normal workflow for arrival, departure, and noon reporting. The collected data feeds standardized reporting templates that can be submitted for MRV verification at the end of the monitoring period. In addition, We4Sea clients can continuously monitor their fuel consumption and CO<sub>2</sub> emissions in real-time via an online dashboard. *fs*