LOSS PREVENTION UPDATE

MARITIME DIGITALISATION

This loss prevention update provides insights into the latest advancements in maritime digitalisation, including autonomous shipping, Artificial Intelligence (AI) based monitoring systems, and AI-driven solutions for voyage optimisation and data calculations. This publication serves as a valuable resource for keeping stakeholders informed about these developments within the maritime industry. Please note the Loss Prevention department neither endorses nor specifically recommends any of these new technologies.

MARITIME AUTONOMOUS SURFACE SHIPS (MASS)

Various trials are taking place on MASS; however, none of the ships are operating in fully autonomous mode (i.e., Degree 4 of automation), except for uncrewed surface vessels (USVs). USVs are typically small boats used for various applications, such as hydrographic surveys, oceanographic research, and various military purposes. Below are some of the MASS projects in trial mode; some are commercially active yet still in the trial phase.

YARA BIRKELAND

Launched in 2022, YARA BRIKELAND is a 120 Twenty-foot Equivalent Unit (TEU) open-top container ship, fully battery-powered. It is commercially active but not fully automated yet. After final approval, it is intended to be fully automated. It is trading between Porsgrunn and Brevik, within Norway's internal waters. An approval in principle has been received from the classification society DNV, which will enable the transfer of the project's Chief Engineer to the Remote Operations Centre.

RIVERDRONE

Naval Inland Navigation NV is operating ten 3850 dwt, 106m long general cargo ships named RIVER DRONE in series (1-10), capable of carrying solid bulk, and project cargoes. This river drone series operates on MASS Degree 3 level using SEAFAR technology. Navigation of the ship, lock passages, mooring and communication with other ships and shore authorities is carried out by the on shore operator in the remote On Shore Control Center (SCC). Ship's crew and captain remains onboard in an advisory role.

HOKUREN MARU NO.2

A 173m long, 11,413 gt Ro-Ro cargo ship, plying between Kushiro and Hitachi, Japan, is undergoing trials with the aim of being fully commercialised and automated by 2025. This ship's autonomous capabilities are being developed in full cooperation with Japan Radio Corporation, YDK Technologies, and Kawasaki Kinkai Kisen.
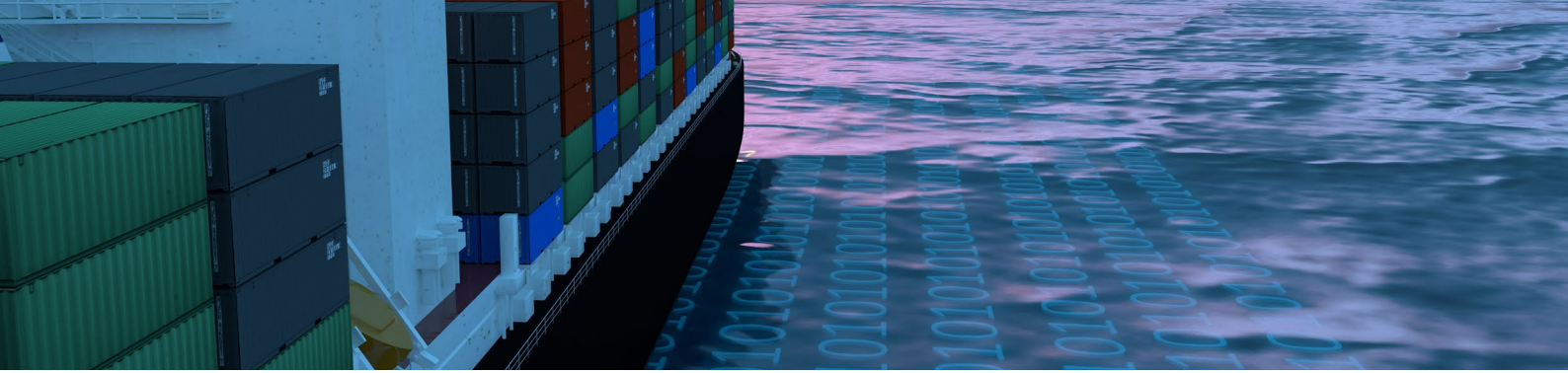
SHIRANAMI

Delivered at the Saiki Shipyard of Honda Heavy Industries Co for the NYK shipping company, the 127m coal carrier is currently transporting overseas-delivered coal from a relay station in Tokyo Bay to the Yokosuka Thermal Power Station. The ship is equipped with a navigation system that uses cameras and sensors to improve situational awareness and aid in collision avoidance. It is also fitted with an engine system capable of identifying engine anomalies and their probable causes. The aim of these systems is to reduce the workload of the crew and achieve a higher level of crewed automation.

POS SINGAPORE

A 1,800 TEU container ship, built at Hyundai Mipo Dockyard (HMD), South Korea, was funded through a public-private partnership. The ship is commercially active and currently in the trial phase. It aims to achieve Degree 3 autonomous operation. An order has been placed for one more ship with similar capabilities. This ship is part of KASS (Korea Autonomous Surface Ship) project.

ZHI FEI

A hybrid electric container feeder with a capacity of 300 TEU and 8,000 dwt, has been commercially active since April 2022. The vessel was built by Qingdao Shipyard. The design was led by Bestway in collaboration with the Shanghai Jiahao Ship Design Institute and Dalian Maritime University. Currently, it is trading between Qingdao, Dongjiakou, and Rizhao. The ZHI FEI is designed to operate at autonomous levels Degree's 2, 3 and 4.

OTHER DEVELOPMENTS

Wärtsilä has provided an autodocking system to the SEASPAN TRADER and SEASPAN TRANSPORTER, 148m-long Ro-Ro cargo ships. The ships are operating between Sidney and Vancouver, Canada.

### AI IN VOYAGE OPTIMISATION AND OTHER CALCULATIONS ONBOARD

- Ardmore Shipping partnered with DeepSea Technologies in early 2024 to implement "Pythia", the company's voyage optimisation tool, across its fleet
- DeepSea Technologies also collaborated with Eastern Pacific Shipping (EPS) for a fleet wide deployment of its "Cassandra Performance Monitoring" platform

- Bearing AI developed the "Fleet Deployment Optimizer" for Hapag-Lloyd to simulate and analyse the efficiency of different ships across various potential schedules
- AI-powered Optical Character Reader (OCR) is used for the automated creation of laytime statements for dry bulk carriers. This AI helps read cargo documents in different formats and prepares the laytime statement automatically.

AI-DRIVEN TECHNOLOGY FOR AN ENGINE ROOM WITHOUT AN ENGINEER

HD Hyundai delivered an 18,000 dwt bulk carrier to HL Lines, equipped with HD Hyundai's Integrated Condition Diagnosis Solution (HiCBM) and Integrated Safety Control Solution (HiCAMS) for engine room monitoring. HiCBM monitors and manages large, core equipment like main engines, auxiliaries, compressors and pumps. It uses AI to detect signs of failures in advance. HiCAMS uses onboard CCTV video feeds and artificial intelligence to watch for safety-related events in real time.

ORCA AI SEAPOD FOR NAVIGATIONAL SITUATIONAL AWARENESS

This system consists of a look-out unit called the "SeaPod," which includes five High Definition (day) cameras and three thermal (night) cameras, typically installed on the compass deck. The Seapod feeds visuals to a monitor on the bridge, displaying what it captures. The AI algorithm of the Orca AI platform integrates data from nine sensors on the bridge including target detection, navigation, environmental and engine data. By combining this data with the SeaPod's visuals, the system aims to identify high-risk targets to assist bridge personnel in making better-informed decisions in real time.
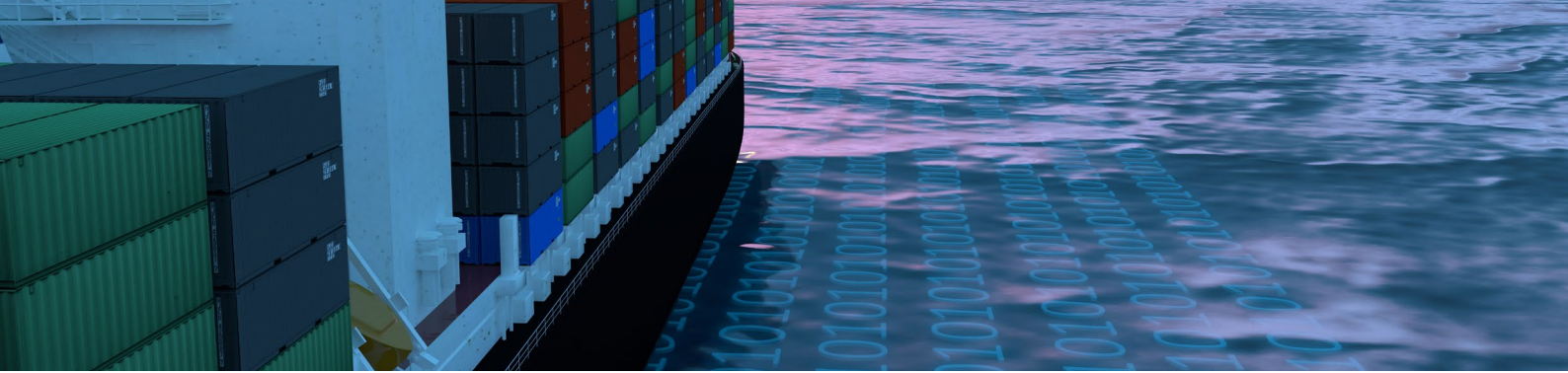
SEA.AI FOR NAVIGATIONAL SITUATIONAL AWARENESS

Installed by Fred. Olsen Express, a Canary Island-based ferry company. The system uses an external unit, typically mounted at the highest point on the ship. This unit is fitted with two high resolution daylight cameras capable of operating in the lowest light and contrast situations. In addition, it has two thermal cameras enabling SEA.AI to function at night. The cameras are both gyro and digitally stabilised to provide a constant watch 360° around the ship.

HINAS 2.0 BY AVIKUS

This system uses AI and augmented reality to integrate various data from bridge equipment, IR (Infrared) cameras, and EO (Electro-Optical) cameras. It enables ships to autonomously perform voyage optimisation, route planning, and collision avoidance. AVIKUS is collaborating with DNV for the development and type approval of HiNAS.

FURTHER READING

- MASS trials
- The use of AI in Shipping

FURTHER INFORMATION

For further information, please do not hesitate to email lossprevention@tindallriley.com.

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