



AUTONOMOUS VESSELS: THE MOMENTUM IS BUILDING

More and more countries have demonstrated an interest in autonomous shipping, with Korea and Scandinavian countries probably being the main protagonists. The United Arab Emirates and several European countries have also confirmed their intention to explore and invest in remote and autonomous maritime technologies.

As the technology gets cheaper and easier to manufacture, there will be an increasing requirement for tighter regulation. We expect to see more guidelines being produced, new legislation developed as well as training programmes introduced, especially tailored for MASS operations.

Industry update

Clearbot's win at Captain's Table 2023¹

Clearbot has won this year's Captain's Table competition, a pitch challenge for start-ups founded in Hong Kong with international connections. The winner is awarded a cash prize of USD30,000 alongside GBP25,000 free legal advice from HFW. The Hong Kong start-up was established in 2019 and is an artificial intelligence (AI) powered autonomous electric boat company offering sustainable alternatives to automate marine services. It can automate tasks in an emissions-free manner and started as a student project to help Indonesian surfers efficiently clean up waterways. Today, the company is also undertaking maritime surveillance and rescue, pollution recovery (through the automation of hazardous waste and oil spill clean up) and goods delivery projects. Clearbot can further assist companies engaged in the maritime services industry around the world benefit from decreased costs, reduced need for manpower and enhanced impact traceability.

Many congratulations to Clearbot on their success; HFW is looking forward to providing them with legal support.

MAID's autonomous docking and positioning²

Australian marine technology company Marine Autonomous Intelligent Docking (MAID) Systems has created an innovative system that can be used in autonomous docking and positioning of ships.

Autonomous docking could be classified as a "Degree one"³ level of autonomy based on the degrees of autonomy identified by the IMO.

This development is important since an autonomous docking capability will be applicable to a wide range of vessels, from those with semi-autonomous functions to those that are fully autonomous.

According to Brad Tyers, CEO of MAID Systems, *"The global marine sector is rapidly moving toward autonomous docking and autonomous shipping to deliver increased operational efficiency, enhanced safety, reduced costs due to damage from marine accidents and reduced carbon emissions through optimised speed profiles for environmental protection. The MAID IP was created to provide unique autonomous options to achieve all these goals, and our proprietary protected method is fundamental to achieving cost-effective and workable solutions"*.⁴

Fugro's Blue Essence USV launch and partnership with Abu Dhabi Ports⁵

Geo-data specialist Fugro has launched UAE's first Unmanned Surface Vessel (USV) in October 2022. The 12-metre Blue Essence sailed from Mugharraq Port to Al Mirfa in Abu Dhabi, which will be the central hub of Fugro's remote and autonomous operations in the region. According to David Washbrook, director at Fugro (Middle East and India), the company *"has been working closely with local authorities and partners in the region to define regulations and legislations around remote and autonomous vessels"*.⁶ Blue Essence "is capable of remote inspection, hydrographical and geophysical survey operations".⁷ It is estimated that its small size will contribute to a 95% fuel reduction compared to manned surface vessels. The USV can be operated fully remotely 24/7 from any remote

operations centre (ROC) irrespective of its location, and clients can have real-time access to "vessel operations and geo-data through a secure web interface".⁸

Fugro has also signed an agreement with UAE-based port operator AD Ports to jointly develop USVs as well as other remote and autonomous technologies in the Middle East region. The two companies aim to launch a platform deploying remote and autonomous technologies as well as preparing guidelines that will help make UAE's regulations in conformity with USV operations. In this way the UAE will be better placed to "receive" USVs and hopefully be used as a testing area in the region. Another objective of this partnership is to run an industry-compliant training programme to familiarise mariners with MASS operations which is likely to assist with the adoption of MASS more widely into the commercial sector.

Holland Shipyards Group to build four autonomous electric ferries⁹

The Swedish government transport agency Trafikverket has contracted Holland Shipyards to construct 4 autonomous electric ferries to be delivered to the agency's ferries unit, Trafikverket Färjerederiet. The contract covers the delivery of the vessels with auto-mooring facilities, charging stations, a simulator facility and a ROC.¹⁰ The ROC will be remotely operating the ferries and located in Stockholm.

The 14.24m vessels are expected to be of IMO Degree two level of autonomy, i.e. remotely controlled from the ROC but with seafarers onboard. Thus, seafarers will be in command of operations when necessary. In addition, the ferries

1 <https://www.hongkongmaritimehub.com/hong-kong-back-in-the-frame-at-highly-anticipated-captains-table-event/>, <http://www.hongkongmaritimehub.com/hong-kong-entrant-takes-the-prize-at-the-captains-table/> & <https://www.clearbot.org/about-us>

2 <https://www.maritime-executive.com/features/autonomous-docking-the-forerunner-to-autonomous-shipping>

3 <https://www.imo.org/en/MediaCentre/HotTopics/Pages/Autonomous-shipping.aspx>

4 <https://maritime-executive.com/corporate/autonomous-docking-positioning-maid-further-expands-its-portfolio>

5 <https://www.seatrade-maritime.com/ship-operations/fugro-and-ad-ports-group-formalise-autonomous-vessel-co-operation>, <https://www.seatrade-maritime.com/technology/fugro-launches-first-uae-uncrewed-vessel>, <https://www.energyclubwa.org.au/ecwa-march-2022-enewsletter-pages/changing-the-game-with-fugro-blue-essence>, <https://www.fugro.com/about-fugro/our-expertise/remote-and-autonomous-solutions/remote-and-autonomous-vessels> & https://media.fugro.com/media/docs/default-source/expertise-docs/fugro-blue-essence_a4.pdf?sfvrsn=401ab019_2

6 <https://www.seatrade-maritime.com/technology/fugro-launches-first-uae-uncrewed-vessel>

7 <https://www.energyclubwa.org.au/ecwa-march-2022-enewsletter-pages/changing-the-game-with-fugro-blue-essence>

8 Ibid.

9 https://www.shippax.com/en/news/holland-shipyards-group-signed-a-contract-with-swedish-trafikverket-for-four-autonomous-electric-ferries.aspx?utm_source=newsletter&utm_medium=email&utm_campaign=Shippax%20News%20Bulletin%20e2%80%93%2040&utm_term= <https://www.imo.org/en/MediaCentre/HotTopics/Pages/Autonomous-shipping.aspx>, <https://futuretransport-news.com/trafikverket-sweden-orders-4-autonomous-electric-ferries/#:~:text=Autonomous%20Vehicles> & <https://www.marinelink.com/news/swedens-trafikverket-orders-autonomous-500009>

10 https://www.shippax.com/en/news/holland-shipyards-group-signed-a-contract-with-swedish-trafikverket-for-four-autonomous-electric-ferries.aspx?utm_source=newsletter&utm_medium=email&utm_campaign=Shippax%20News%20Bulletin%20e2%80%93%2040&utm_term=

will have a 60-car carrying capacity and be operating in Ljusteröleden and Vaxholmsleden. Traversing their designated route will be performed with the push of a button and between each crossing the ferries will be charged at a shore charging station, with the charging process estimated to last only four minutes.¹¹ Further, while the ferries will be running on electricity, they will be equipped with engines running on hydrotreated vegetable oil.¹²

The first ferry is scheduled to be delivered in the second half of 2024. According to Erik Froste, Shipping Manager of Trafikverket, *“This is the largest investment that the ferry company has ever made and is a big step both for the climate and in technology development for safer shipping”*.¹³

Norway's urban autonomous passenger ferry¹⁴

In October 2022, the Norwegian University of Science and Technology (**NTNU**) completed sea trials of what is claimed to be the first urban autonomous passenger ferry world-wide.¹⁵ The 8.5-metre ferry, MilliAmpere 2, is the end product of the work carried out by a large team of researchers and students from different academic backgrounds. The trials, in the form of a shuttle traffic service between Trondheim and Bergen, took place from the end of September to mid-October 2022 with the public permitted to ride on the ferry during the trial period.¹⁶

This future-oriented form of transport enabled pedestrians to reduce a

15-minute walk to a one-minute trip, which can commence after the vessel is summoned by the touch of a button. MilliAmpere 2 is a “self-propelled electric passenger ferry” that is charging when docked, offering a more sustainable way of transport to the public.¹⁷ Its deck is equipped with “a number of sensors such as rangefinders, cameras, laser vision and radar” to assist with data collection for collision avoidance purposes.¹⁸ Sensors are also installed to enable land-based control operation and monitoring when needed. MilliAmpere 2 has room for 20 people although capacity was capped at 12 during the trials.¹⁹

Importantly, other countries have expressed their interest in operating ferries of this type. France has considered deploying similar ships in the Seine during the 2024 Olympics. NTNU's technology will also be used by Zeabuz in a collaboration with Norwegian ferry company Torghatten, to put in operation a self-propelled ferry in Stockholm during this summer. The vessel will be navigating between Södermalm and Kungsholmen.

According to Morten Breivik, associate professor at NTNU's Department of Engineering Cybernetics, this type of ferry *“will be significantly cheaper to operate than staffed ferries and can be more easily deployed on multiple routes as necessary. In the long term, the ferries may make it more attractive to live in the district, particularly for young people who want access to better mobility options”*.²⁰

Kongsberg's systems for the Polish Navy²¹

Norwegian supplier, Kongsberg Maritime, has stated that it will supply three shipsets of HUGIN Autonomous Underwater Vehicles (AUV) to the Polish shipbuilder Remontowa Shipbuilding SA (**RSB**) along with related High Precision Acoustic Positioning (**HiPAP**) and navigation systems for the shipyard's three newbuild warships for the Polish Navy.²² The Polish Navy requires the AUVs and relevant systems for its “Kormoran II-class Mine Countermeasure (**MCM**) vessels programme”.²³ The contract in question has a cumulative value of around 10 million Euros and follows the one secured by Kongsberg for the first three MCM vessels built by RSB. Under the second awarded contract for the equipment intended for vessel nos. 4, 5 and 6 of the programme, the shipsets will be delivered to RSB in the next four years. This is for the purpose of aligning with the warships' delivery, scheduled from 2026 to 2027.

Kongsberg's HUGIN AUVs can be employed for fully autonomous remote subsea search and survey purposes in order to collect high-quality data.²⁴ They demonstrate high manoeuvrability and great stability for data collection purposes.²⁵ Further, the AUVs have a hydrodynamic shape, excellent battery capacity and can carry out their operations autonomously without surface vessel support. These characteristics, in combination with HUGIN working together with HiPAP

11 Ibid.

12 <https://futuretransport-news.com/trafikverket-sweden-orders-4-autonomous-electric-ferries/#:~:text=Autonomous%20Vehicles>

13 Ibid.

14 <https://www.bairdmaritime.com/work-boat-world/passenger-vessel-world/ferries/vessel-review-milliampere-2-norwegian-university-develops-autonomous-electric-ferry-demonstrator/>, <https://www.101sustainableideas.com/idea/autoferry/>, <https://maritime-executive.com/editorials/ntnu-trials-world-s-first-urban-autonomous-passenger-ferry> & <https://www.youtube.com/watch?v=wVMWbMSIaXM>

15 <https://www.bairdmaritime.com/work-boat-world/passenger-vessel-world/ferries/vessel-review-milliampere-2-norwegian-university-develops-autonomous-electric-ferry-demonstrator/>

16 Ibid.

17 Ibid.

18 <https://maritime-executive.com/editorials/ntnu-trials-world-s-first-urban-autonomous-passenger-ferry>

19 Ibid.

20 Ibid.

21 [https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20\(RSB\),](https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20(RSB),) <https://www.kongsberg.com/maritime/about-us/news-and-media/news-archive/2022/polish-navy-supply/> & <https://www.marinelink.com/news/kongsberg-equip-three-polish-navy-500089>

22 [https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20\(RSB\),](https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20(RSB),) <https://www.kongsberg.com/maritime/about-us/news-and-media/news-archive/2022/polish-navy-supply/> & <https://www.marinelink.com/news/kongsberg-equip-three-polish-navy-500089>

23 <https://www.marinelink.com/news/kongsberg-equip-three-polish-navy-500089>

24 [https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20\(RSB\),](https://www.naval-technology.com/news/kongsberg-auv-hipap-polish-ships/#:~:text=Kongsberg%20Maritime%20has%20secured%20a,company%20Remontowa%20Shipbuilding%20(RSB),)

25 <https://www.kongsberg.com/maritime/about-us/news-and-media/news-archive/2022/polish-navy-supply/>

systems that enable the acquisition of high-accuracy position updates and real time communications, are important attributes, making the AUVs a strong candidate for militaries and governments worldwide. In the words of Dariusz Jaguszewski, Chief Commercial Officer of RSB, *“These mine countermeasure vessels represent an important contract for Remontowa Shipbuilding as well as an important statement and reinforcement of Poland’s national security in a fast-changing world”*.²⁶

Royal Navy’s participation in NATO’s autonomous exercises²⁷

In October 2022, and for a month-long trial, Royal Navy’s HMS Lancaster and HMS Hurworth were leading participants in NATO’s autonomous exercises off the coast of Portugal.²⁸ As part of the trial hosted by the Portuguese Navy, “more than 11 warships, 120 autonomous vehicles and 1,500 military and civilian personnel from 15 NATO countries” examined the use of unmanned technologies.²⁹ These ranged from drones to underwater survey vessels that can be employed by the alliance for future operations.³⁰ HMS Lancaster’s contribution was critical, operating as the command hub and transmitting information to other vessels in the task force to facilitate their decision-making processes during different scenarios.

Unmanned naval drone off Crimea³¹

In September 2022, a drone boat was washed-up close to the Russian naval base in Sevastopol, Crimea, and was destroyed by Russian forces after it was towed at sea and blown up.³² This

incident could perhaps be linked to the lack of Russian Navy operations around the area at the time.

Ukraine is believed to be behind the vessel’s operation, with speculation that this semi-submersible drone may have been supplied by the U.S., as part of a US\$800 million security assistance package. The package is said to have contained an unspecified number of “unmanned coastal defence vessels”.³³ In November 2022, the vessel was confirmed to be of the same type as vessels which carried out an attack on the Russian Black Sea Fleet at the end of October of the same year. It was equipped with “a camera, infra-red sensors, communications antennae and bow-mounted sensors”.³⁴ These tools would likely enable the vessel to detect a target close enough to trigger its payload.

Avikus and Raymarine’s autonomous navigation system for recreational boats³⁵

Avikus, HD Hyundai’s autonomous navigation in-house start-up, has signed a Memorandum of Understanding (**MoU**) with marine electronics specialist Raymarine for the launch of a level 2 autonomous navigation system for yachts. The product is considered to be the world’s first “autonomous leisure boat” solution.³⁶

Combining the words “neuron” and “boat”, the AI-based autonomous system NeuBoat is intended to function as the ship’s “brain” with regards to handling “situational awareness, recognition, decision-making and control” in different

maritime settings.³⁷ The purpose of the partnership is to undertake a joint research and development project to integrate NeuBoat and Raymarine products and introduce autonomous sailing to the leisure market. The companies share the view that autonomous capability will make sailing easier, especially when carrying out docking manoeuvres and navigating in congested areas, ultimately luring more customers which could be both existing as well as prospective owners.

BIMCO’s AUTOSHIPMAN³⁸

BIMCO is working on the industry’s “first ship management contract for autonomous ships” called “AUTOSHIPMAN”.³⁹ In early 2023, a “beta” version of the AUTOSHIPMAN will be tested to assess the clauses relating to the remotely controlled operation of a vessel. The third-party management contract AUTOSHIPMAN is based on BIMCO’s SHIPMAN and is being drafted using a more engineering-oriented approach. Amendments to SHIPMAN will also be incorporated in the contract.

HFW is the only law firm collaborating with BIMCO on this project, with Partner Gudmund Bernitz and Associate Henry Clack forming part of the drafting sub-committee. Further updates will follow in due course.

26 Ibid.

27 <https://www.royalnavy.mod.uk/news-and-latest-activity/news/2022/december/15/221215-royal-navy-spent-10000-hours-on-nato-operations-in-2022>, <https://www.forces.net/navy/news/royal-navy-leads-game-changing-nato-autonomous-tech-exercises> & <https://www.royalnavy.mod.uk/news-and-latest-activity/news/2022/october/10/20221010-royal-navy-leads-game-changing-nato-tech-experiments>

28 <https://www.royalnavy.mod.uk/news-and-latest-activity/news/2022/december/15/221215-royal-navy-spent-10000-hours-on-nato-operations-in-2022>

29 Ibid.

30 Ibid.

31 <https://www.navyrecognition.com/index.php/naval-news/naval-news-archive/2022/september/12227-a-mysterious-ukrainian-naval-drone-discovered-off-crimea.html>, <https://www.forbes.com/sites/davidhambling/2022/09/22/mystery-vessel-may-be-new-ukrainian-attack-drone/?sh=644a0e3f7a77> & <https://news.usni.org/2022/10/11/suspected-ukrainian-explosive-sea-drone-made-from-jet-ski-parts>

32 <https://www.forbes.com/sites/davidhambling/2022/09/22/mystery-vessel-may-be-new-ukrainian-attack-drone/?sh=644a0e3f7a77>

33 Ibid.

34 Ibid.

35 <https://marineindustrynews.co.uk/raymarine-and-avikus-announce-partnership/> & <https://smartmaritimenetwork.com/2022/10/28/raymarine-signs-mou-for-avikus-autonomous-vessel-tech/>

36 <https://marineindustrynews.co.uk/raymarine-and-avikus-announce-partnership/>

37 <https://smartmaritimenetwork.com/2022/10/28/raymarine-signs-mou-for-avikus-autonomous-vessel-tech/>

38 <https://www.bimco.org/insights-and-information/general-information/20221110-autonomy>, <https://www.bimco.org/contracts-and-clauses/upcoming-contracts-and-clauses> & <https://www.bimco.org/insights-and-information/contracts/20221213-shipman-revision>

39 <https://www.bimco.org/contracts-and-clauses/upcoming-contracts-and-clauses>

“In December 2022, Samsung Heavy Industries became the first shipyard to be recognised by DNV for applying blockchain technology to Samsung Autonomous Ship and to the digital asset management system of SHI, SVESSEL ® eLogbook.”

Samsung Heavy Industries (SHI): from autonomous navigation to blockchain applications and smart yards⁴⁰

In November 2022, SHI successfully completed a demonstration of its autonomous navigation technology “Samsung Autonomous Ship” (SAS) on the Mokpo Maritime University’s training vessel “SEGERO”. SHI installed the SAS on the 9,000-tonne ship after obtaining special permission from the Korean Ministry of Oceans and Fisheries. Operating in Korean waters and while on autonomous navigation, “SEGERO” successfully avoided 29 collision risk situations. The SAS system interfaces with the engine and rudder controls to allow the system to carry out collision avoidance manoeuvres. The company reports that it achieved a high-level performance in a particularly challenging setting given the presence of several fishing boats close to “SEGERO”. The system works by recalculating and creating

safe avoidance routes every five seconds taking data from radar, AIS and cameras to assess its situational recognition.⁴¹

In December 2022, SHI became the first shipyard to be recognised by DNV for applying blockchain technology to SAS and to the digital asset management system of SHI, SVESSEL ® eLogbook.⁴² The blockchain application is used as part of the systems Collision Risk Index and Distance to the Closest Point of Approach. SHI has described blockchain technology as “ground-breaking” in data security for autonomous vessels and Vidar Dolonen, DNV’s Regional Manager for Korea and Japan has stated that “Blockchain technology is an essential requirement for future ships and to respond to upcoming maritime regulations”.⁴³

Finally, SHI has signed an MoU with the French software company, Dassault Systèmes, to create a

digital “smart yard”.⁴⁴ Virtual twin technologies will be used to digitally transform SHI’s shipyard and Dassault’s 3DEXPERIENCE platform-based smart yard and will operate in real time.⁴⁵ It is anticipated that this will enhance production methods in the shipyard, production execution (enabling SHI to especially address the demand for LNG carriers), assembly operations as well as the shipyard’s operations’ scheduling, streamlining and automation of the flow of information necessary for construction purposes.⁴⁶ Construction costs and delivery times would probably also be reduced and the quality of ships increased.

Belgian autonomous, zero-emission cross-channel vessel obtains AiP⁴⁷

Lloyd’s Register (LR) has granted “Approval in Principle” (AiP) for a 328-foot vessel designed and developed by Belgium-based Zulu Associates and the Anglo Belgian

⁴⁰ <https://maritime-executive.com/article/samsung-conducts-500-mile-test-of-autonomous-navigation-technology>, <https://www.offshore-energy.biz/shi-teams-up-with-dassault-to-transform-into-a-smart-yard/>, <https://www.ship-technology.com/news/dassault-shi-smart-digital-shipyard/>, <https://www.dnv.com/news/dnv-awards-first-blockchain-statement-of-fact-to-samsung-heavy-industries-236959> & <https://smartmaritimework.com/2022/12/16/samsung-heavy-industries-trials-blockchain-system-to-secure-autonomous-vessel-data-streams/>

⁴¹ <https://maritime-executive.com/article/samsung-conducts-500-mile-test-of-autonomous-navigation-technology>

⁴² <https://www.dnv.com/news/dnv-awards-first-blockchain-statement-of-fact-to-samsung-heavy-industries-236959>

⁴³ Ibid.

⁴⁴ <https://www.offshore-energy.biz/shi-teams-up-with-dassault-to-transform-into-a-smart-yard/>

⁴⁵ <https://www.ship-technology.com/news/dassault-shi-smart-digital-shipyard/>

⁴⁶ Ibid.

⁴⁷ <https://www.zulu-associates.com/>, <https://www.maritime-executive.com/index.php/article/design-for-autonomous-zero-emission-cross-channel-vessel-obtains-aip> & <https://workboat365.com/commercial-marine-news/ship-boat-building/shortsea-cargo/lr-awards-aip-for-zulu-mass-short-sea-autonomous-zero-emission-vessel-2/?amp=1>

Shipping Company. The vessel will be uncrewed, with a zero-emissions propulsion system and a 200 TEU capacity. It is planned to operate in the English Channel and the North Sea.

The proposed operation will be a significant MASS breakthrough for both Europe and globally. According to Mike Holliday, UK & Ireland Area Manager for LR, “LR is delighted to have granted AiP for this design, which has the potential to use a number of alternative propulsion technologies and helps to underline our credentials as an organisation dedicated to driving forward digitalisation and decarbonisation in the maritime industry”.⁴⁸

Daewoo Shipbuilding & Marine Engineering’s (DSME) DS4 smart ship platform⁴⁹

South Korean shipbuilding company DSME has tested the autonomous navigation capabilities of its DS4 smart ship platform on board a small demonstration boat, the “DAN-V”. The American Bureau of Shipping classification society granted initial certification of this technology in October 2021.⁵⁰

“DAN-V” is equipped with navigation systems equivalent to those used on conventional large commercial vessels. The tests ran for 2 days, with the vessel sailing in an area southwest of Seoul. During the demonstration, no crew were on board the ship and DSME sent commands remotely to DAN-V from a ROC ashore, monitoring tasks such as the starting and stopping of the

engine. DAN-V navigated a planned route and manoeuvred successfully to avoid collisions.

Following the successful completion of the demonstration, the company reported that DS4 qualifies for IMO Degree three of autonomy certification. The latter applies to remotely controlled ships without seafarers on board. DSME is aiming to acquire Degree four autonomous navigation by 2024.⁵¹

Exail’s DriX and multi-sensor AUV⁵²

Robotics expert Exail (formerly iXblue) has developed the maritime drone DriX. DriX gained AiP from Bureau Veritas and has now been awarded a certificate for USVs from Lloyd’s Register (LR) in December 2022. The certification confirms that DriX “meets critical safety requirements to be operated at sea”.⁵³ The vessel’s system design was assessed based on LR’s Register Code for Unmanned Marine Systems and its review involved a “detailed system level analysis, construction survey, as well as sea trials”.⁵⁴ Aspects such as “structural integrity, stability, as well as command and control” were also evaluated, “in the context of remotely supervised autonomy”.⁵⁵ Stéphane Vannuffelen, Marine Autonomy Technical Director at Exail said that “By working together with class societies such as Lloyd’s Register, that attest of maritime drones’ highest levels of safety and environmental compliance, we aim to demonstrate that autonomous technologies are safe to deploy and operate. Through such collaborations, we hope to be able to help strengthen the global

acceptance of maritime drones within our industries, as they support operational efficiency, as well as a safe, sustainable maritime energy transition”.⁵⁶

In addition, Exail entered into a contract with the French Government Defence procurement and technology agency (DGA) regarding the rental of the A18D AUV for the French Navy.⁵⁷ The duration of the agreement will be approximately 2 years and part of it concerns “the academic and operational training of 12 sailors”.⁵⁸ The AUV, the design of which will enable it to be connected to different types of vessels, is destined to undertake operations “at depths of up to 3000m for mapping, sonar imaging and high-resolution inspection of pipelines and cables”.⁵⁹ These missions can be carried out fully autonomously and the French Navy aspires to employ this multi-sensor vessel to generally monitor and gain a better understanding of the seabed. Acquiring an enhanced understanding of the deep ocean has become of increasing interest to countries around the world as a means of protecting national interests.⁶⁰

This is seen as an important development following the recent damage to critical infrastructure in Europe and recognition of the vulnerability of our oil and gas networks and cables to malicious attack – see our previous bulletin on the subject: <https://www.hfw.com/downloads/004471-HFW-NordStream-leaks-are-our-arteries-safe.pdf>.

48 <https://www.lr.org/en/latest-news/aip-for-zulu-mass-zero-emissions-container/>

49 <https://maritime-executive.com/article/dsme-completes-autonomous-navigation-test-using-remote-controls> & <https://insurancemarineneeds.com/insurance-marine-news/dsme-completes-autonomous-navigation-test-using-remote-controls/>

50 <https://maritime-executive.com/article/dsme-completes-autonomous-navigation-test-using-remote-controls>

51 <https://insurancemarineneeds.com/insurance-marine-news/dsme-completes-autonomous-navigation-test-using-remote-controls/>

52 <https://www.offshore-energy.biz/first-for-lloyds-register-as-it-certifies-an-uncrewed-surface-vessel/>, <https://www.unmannedsystemstechnology.com/2022/12/drix-platform-receives-first-lloyds-register-certification-for-a-usv/>, <https://www.rivieramm.com/news-content-hub/news-content-hub/lr-awards-first-certification-for-an-uncrewed-surface-vessel-74157>, <https://www.lr.org/en/latest-news/lr-certifies-drix-uncrewed-surface-vessel/>, <https://www.unmannedsystemstechnology.com/2022/12/multi-sensor-auv-selected-by-french-navy/> & <https://www.unmannedsystemstechnology.com/2022/11/exail-to-develop-new-experimentation-of-drix-usv-for-french-navy/>

53 <https://www.unmannedsystemstechnology.com/2022/12/drix-platform-receives-first-lloyds-register-certification-for-a-usv/>

54 Ibid.

55 <https://www.lr.org/en/latest-news/lr-certifies-drix-uncrewed-surface-vessel/>

56 Ibid.

57 <https://www.unmannedsystemstechnology.com/2022/12/multi-sensor-auv-selected-by-french-navy/>

58 Ibid.

59 Ibid.

60 Ibid.

“Whilst we expect competition in the sector to grow, the adoption of the idea that new autonomous technology is here to stay is becoming more widespread. We are already seeing an increase in the number of multi-disciplinary collaborations ranging from recreational yachts to warships and other military applications.”

SEA-KIT's export of USV to the US⁶¹

UK-based SEA-KIT, provider of high technology solutions to the maritime and research industries, agreed the company's first US export sale of a 12-metre X-class USV to ThayerMahan.⁶² The USV is a “remotely controlled mother-ship platform that can launch and recover remote vehicles”.⁶³ Its operations relate to “deep-water bathymetry, offshore and subsea asset inspection and hydrographic survey work”.⁶⁴ Based on the export deal, it will be delivered in the spring of 2023 and become operational by the summer of the same year.⁶⁵

ThayerMahan is based in Connecticut, USA, and said in a statement that it chose SEA-KIT's vessel for its high payload capacity and ability to endure high sea states. Mike Connor, President and CEO at ThayerMahan, stated that “SEA-KIT's flexible payload design enables us to host multiple, sophisticated maritime sensing systems onboard, which in turn will support ThayerMahan to continue leading the field of remote and autonomous mobile acoustic sensing and sense making”.⁶⁶ The

company intends to use the USV for government service purposes as well as for its commercial activities in both the US and in international waters. In this respect, Mike Connor has also said that the USV “will enhance the protection of ports and vessels at sea as well as have a positive impact on illicit trafficking across international borders”.⁶⁷

Round up

It is interesting to see greater collaboration amongst governments, universities, navies, shipbuilders, classification societies and technology companies. Whilst we expect competition in the sector to grow, the adoption of the idea that new autonomous technology is here to stay is becoming more widespread. We are already seeing an increase in the number of multi-disciplinary collaborations ranging from recreational yachts to warships and other military applications.

There is recognition that MASS operations can have a positive impact from a sustainability perspective. Autonomous electric vessels can contribute to fuel reduction and play

a significant role in the sustainable maritime energy transition. However, the risk of cyber-security threats remains a key concern, especially in relation to ROCs that could be susceptible to cyber-attacks.

To accommodate MASS-related developments, we are observing a significant increase in the creation of supporting systems and infrastructure. Autonomous navigation technologies, autonomous docking systems and so-called “smart yards” are examples of what we believe will form a “support system” to further encourage MASS projects.

HFW continue to advise on autonomous shipping-related initiatives and remain at the forefront of developments in this area. Our team is involved in a variety of different projects in connection with MASS, working with several professionals within the industry to cover as many aspects as possible. Alongside providing legal and regulatory advice, we are constantly monitoring market developments and supporting autonomous shipping initiatives.

⁶¹ <https://www.sea-kit.com/post/press-release-sea-kit-secures-usv-export-deal>, <https://www.seatrade-maritime.com/autonomous-shipping/sea-kit-secures-uncrewed-surface-vessel-export-deal> & <https://www.offshore-energy.biz/sea-kit-and-thayermahan-agree-usv-export-deal/>

⁶² <https://www.seatrade-maritime.com/autonomous-shipping/sea-kit-secures-uncrewed-surface-vessel-export-deal>

⁶³ <https://www.offshore-energy.biz/sea-kit-and-thayermahan-agree-usv-export-deal/>

⁶⁴ Ibid.

⁶⁵ <https://www.sea-kit.com/post/press-release-sea-kit-secures-usv-export-deal>

⁶⁶ <https://www.sea-kit.com/post/press-release-sea-kit-secures-usv-export-deal>

⁶⁷ <https://www.sea-kit.com/post/press-release-sea-kit-secures-usv-export-deal>

Past events

Maritime Autonomous Systems Regulatory Working Group Conference 2023

17 & 18 January 2023

<https://www.maritimeuk.org/events/events/masrwg-conference2023/>

2023 Maritime Users Conference

25 January 2023

<https://www.ixblue.com/event/2023-maritime-users-conference/>

Autonomous Ship Reality Webinar

8-10 March 2023:

https://www.bigmarker.com/series/autonomous-ship-reality/series_details

HFW's London Senior Associate & Mariner Jonathan Goulding was a speaker at the conference, which was hosted by Ship Navigation and Voyage Optimization and focused on commercial autonomous ship reality from today's and tomorrow's perspectives.

If you are interested in finding out more about our work, please feel free to reach out to our team:



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