



## MASS UPDATE PART 2 AUTONOMOUS SHIPPING: A REALITY

**Welcome to our latest market round-up of some of the latest and more interesting stories that have caught our eye in the fast-moving world of MASS and autonomous shipping.**

The volume and speed of autonomous shipping related developments is no longer a surprise but a reality. In the past months we have seen various new projects being introduced. These concern not only different types of vessels and autonomous systems, but a diverse range of participants and industries as well.



# “The ESA and One Sea have confirmed their collaboration on the establishment of space-enabled services that will facilitate shipping’s transition towards autonomous shipping.”

Containerships, including feeder containerships, cargo ships, LNGs, ferries and other types of unmanned vessels are in the spotlight. Interestingly, Artificial Intelligence (AI) technologies are being increasingly deployed for intelligence-gathering and mine-detection purposes. As a result, the spectrum of stakeholders becomes gradually wider; from navies to port authorities and even space agencies, this field attracts – and is anticipated to continue to attract – participants from multiple fields.

Wider public access to autonomous shipping is evident, mainly via the growing operation of autonomous ferries. Automated vessel capabilities often go hand in hand with electric power, thus enabling companies and states to promote their sustainability objectives as well.

The expansion of autonomous shipping related initiatives is likely to motivate the adjustment of ancillary but indispensable services, such as those provided by ports and terminals, to cater for the industry’s changing needs. This will almost certainly be translated into high level capital costs.

Recent concerns about AI’s regulation worldwide are, of course, also relevant to shipping. Technology typically develops at a much faster pace than the legislation which is required to regulate it. Robust implementation of suitable legal frameworks at both national and international level to govern this area is essential.

## Industry update

### Remotely operated vehicles (ROVs) deployed in the search for the OceanGate submersible

Two ROVs joined the search to locate the OceanGate submersible which went missing in late June and was later discovered to have been destroyed due to an implosion.<sup>1</sup> One ROV was deployed by the French vessel *L’Atalante* and another by the Canadian ship *Horizon Arctic*. The ROVs reached the sea floor and the debris they discovered around the wreck was later analysed to assess the situation.<sup>2</sup>

### Ørsted patents first unmanned ship design for the offshore industry

Ørsted, operating in the wind farms sector, has patented the design of “Hugin USV”, which will be used for the collection of wind and seabed-related data, and biological and ecological measurements.<sup>3</sup> The Uncrewed Surface Vessel (USV) should have the capacity to operate for a year-long period, withstand rough weather conditions and be controlled at various levels of autonomy. The company anticipates producing five new vessels of this type by the end of this year.<sup>4</sup>

### Autonomous 3D-printed ferry to operate during the Paris Olympics

Holland Shipyards Group, Sequana Développement and Roboat are developing an autonomous electric passenger ferry, which will traverse the Seine during the 2024 Olympics in Paris.<sup>5</sup> The ferry is expected to attain Degree 4 of autonomy (according to the relevant IMO categorisation<sup>6</sup>) and is also anticipated to be the biggest 3D-printed autonomous ferry. It will be printed using recycled materials, will have 35 people capacity and dimensions of 9 by 3.90 metres. The vessel will operate in a location close to the major sporting events and will be moored and charged automatically.

### European Space Agency (ESA) announces debut participation in autonomous shipping<sup>7</sup>

The ESA and One Sea have confirmed their collaboration on the establishment of space-enabled services that will facilitate shipping’s transition towards autonomous shipping.<sup>8</sup> The two parties signed a memorandum of intent (MOI) “to support the development and demonstration of space solutions in addressing user

1 <https://www.cbsnews.com/news/missing-titanic-sub-french-rov-search-seafloor-fear-oxygen-supply/>

2 <https://maritime-executive.com/article/uscg-is-analyzing-debris-field-rov-found-near-titanic-wreck>

3 <https://orsted.com/en/media/newsroom/news/2023/06/13698206>

4 <https://www.ship-technology.com/news/orsted-patents-uncrewed-surface-vessel-design/#:~:text=Offshore%20wind%20farm%20developer%20C3%98rsted,a%20year%20at%20a%20time>

5 <https://www.hollandshipyardsgroup.com/news/an-autonomous-ferry-in-paris-for-the-summer-of-2024>

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

7 [https://www.esa.int/Enabling\\_Support/Preparing\\_for\\_the\\_Future/Discovery\\_and\\_Preparation/Making\\_way\\_for\\_autonomous\\_ships](https://www.esa.int/Enabling_Support/Preparing_for_the_Future/Discovery_and_Preparation/Making_way_for_autonomous_ships)

8 <https://one-sea.org/the-one-sea-association-and-the-european-space-agency-esa-have-signed-a-memorandum-of-intent-moi/>

needs".<sup>9</sup> Satellite communications and satellite navigation are essential to the development of autonomous capabilities in the shipping sector; during sea voyages satellites can be located closer to land than vessels, and therefore provide crucial assistance in facilitating communications with and control of autonomous ships. We look forward to following the progress of this collaboration.

### **Autonomous LNG carrier project developed by Samsung Heavy Industries (SHI) and Kongsberg Maritime<sup>10</sup>**

SHI and Kongsberg Maritime are working together on the development of an autonomous LNG carrier. The autonomous 174,000-cbm vessel's design is considered to be efficient from an operational risk and costs perspective and is the product of both companies' interest in innovative solutions and sustainability.

### **Cargo ship and inland waterway barge perform autonomous navigation voyages in Norway and Belgium**

In late May 2023, Kongsberg Maritime successfully demonstrated autonomous technologies on board the Fishery Support Vessel *Eidsvaag Pioneer*, which completed a 160 nautical mile autonomous voyage in Norway.<sup>11</sup> The vessel operates off the Norwegian coast supplying fish farms and, as part of the EU AUTOSHIP project, was equipped for remote, autonomous operations. During the trial, which lasted for over 13 hours, the vessel completed autonomous docking, undocking, navigation and manoeuvring.<sup>12</sup> The vessel was monitored by the captain and engineer at Kongsberg's land

based ROC in Ålesund, although crew members were on board for back up and regulatory purposes.<sup>13</sup>

Following the above cargo ship demonstration, and also as part of the AUTOSHIP project, the waterway barge *Zulu 4* successfully completed a trial of its autonomous technology in Belgium.<sup>14</sup> The vessel is owned by Blue Line Logistics NV and was tested using Kongsberg's technologies for autonomous docking, crossing and navigation. *Zulu 4* was equipped with onboard control technology, a crew for back up purposes and was also assisted by a ROC for the completion of its circuit of approximately 9 nautical miles.

### **Korea Shipbuilding & Offshore Engineering (KSOE) and American Bureau of Shipping (ABS) collaborate on AI-based systems<sup>15</sup>**

KSOE and ABS have signed a Memorandum of Understanding to engage in further autonomous vessel-related work. The companies have teamed up to refine an AI-based LNG fuel propulsion system, Hi-GAS+. They will demonstrate the latter as well as an "on board integrated safety control system" on ships by 2024.

### **Nippon Yusen Kaisha (NYK) invests in Ghelia's AI solutions<sup>16</sup>**

NYK is investing in Ghelia for the development and implementation of AI into the maritime sector.<sup>17</sup> They will be examining the utilisation of technologies such as digital engineering and digital twins, to promote technologies such as autonomous ship systems into the shipping industry. The companies are also working on research and development involving autonomous vessels, as well as on avoidance navigation.<sup>18</sup>

### **Hyundai Heavy Industries' (HHI) obtains Approval in Principle (AiP) for autonomous navigation system<sup>19</sup>**

The Korean Register (KR) and the Liberian Registry (LISCR) granted AiP to HHI's autonomous navigation system, Hyundai Intelligent Navigation Assistant System (HiNAS 2.0). The system, which can assist with collision avoidance and optimal route and speed decisions, is the product of Avikus, a subsidiary of HHI. Obtaining AiP indicates that HiNAS 2.0 is now operative and can be installed on vessels, enabling Avikus to progress towards the objectives it's CEO referred to in 2022 and quoted in one of our previous bulletins<sup>20</sup>: "...in the future, we will strive to equip all large ships in the world with HiNAS 2.0 by obtaining approval from various shipping associations and countries".<sup>21</sup>

### **Cochin Shipyard to build up to four autonomous feeder containerships<sup>22</sup>**

Netherlands-based Samskip has contracted Cochin Shipyard in India to construct the "world's first zero-emission feeder container vessels" for autonomous operations.<sup>23</sup> The contract's value is estimated at USD 66 million and covers the construction of two vessels of 500 TEU capacity each. The ships will be delivered in 2-3 years, and it is estimated they will save 25,000 tonnes of CO2 emissions per year.

### **Atlas Elektronik UK to deliver autonomous mine-hunting systems to the Royal Navy<sup>24</sup>**

Atlas Elektronik UK has been contracted to develop three MHC autonomous underwater vessel (AUV) systems for the Royal Navy.

9 <https://business.esa.int/news/one-sea-association-and-esa-partner-to-support-uptake-autonomous-shipping-maritime-sector>

10 <https://www.tradewindsnews.com/gas/samsung-and-kongsberg-look-to-develop-autonomous-lng-carriers/2-1-1422807>

11 <https://maritime-executive.com/article/norwegian-ship-completes-160-mile-autonomous-navigation-demonstration>

12 <https://www.seatrade-maritime.com/autonomous-shipping/eidsvaag-pioneer-completes-complex-160-nm-autonomous-voyage>

13 <https://www.marinelog.com/news/cargo-vessel-completes-landmark-autonomous-voyage/>

14 [https://maritimeeconomy.com/post-details.php?post\\_id=bGhpbg==&post\\_name=KONGSBERG%20successfully%20demonstrates%20autonomous%20vessel%20operations%20on%20Belgiums%20inland%20waterway%20network&segment\\_name=6](https://maritimeeconomy.com/post-details.php?post_id=bGhpbg==&post_name=KONGSBERG%20successfully%20demonstrates%20autonomous%20vessel%20operations%20on%20Belgiums%20inland%20waterway%20network&segment_name=6)

15 <https://loydslist.maritimeintelligence.informa.com/LL1143510/KSOE-expands-autonomous-vessel-projects-with-ABS>

16 <https://maritime-executive.com/article/nyk-invests-in-ai-company-for-autonomous-shipping-and-applications>

17 Ibid.

18 <https://loydslist.maritimeintelligence.informa.com/LL1143805/NYK-partners-with-technology-company-Ghelia-to-adopt-AI-in-shipping>

19 <https://maritime-executive.com/article/hd-hyundai-gets-aip-for-its-second-gen-autonomous-nav-system>

20 <https://www.hfw.com/downloads/004500-HFW-Autonomous-Ships-The-Future-Is-Now.pdf>

21 <https://maritime-executive.com/article/first-automation-systems-to-be-installed-on-south-korean-ships-in-2023>

22 <https://maritime-executive.com/article/samskip-to-build-zero-emission-autonomous-feeder-ships-at-cochin>

23 Ibid.

24 <https://www.naval-technology.com/news/atlas-elektronik-uk-to-provide-mine-hunting-auvs-for-british-royal-navy/>

# “It is interesting to see that MASS are gradually becoming part of not just commercial, but also legal discussions, especially with reference to high-profile cases such as the CMA CGM Libra.”

The deal comprises 9 vessels in total and includes the provision of relevant training for three years post delivery. The contract’s value is GBP 32 million and the first piece of AUV equipment will be delivered by 2024.

## Fugro’s Blue Essence receives navigation licensing<sup>25</sup>

In our last bulletin, we referred to *Blue Essence*’s launch and sailing to Abu Dhabi, Fugro’s central hub for autonomous operations in the region.<sup>26</sup> In April 2023, the USV received “full navigation licensing from the UAE Ministry of Energy and Infrastructure”.<sup>27</sup> *Blue Essence* is the first USV that is registered under the UAE flag and it can be operated from any onshore remote control centre operated by Fugro.

## Autonomous ferry launched in Sweden in June 2023<sup>28</sup>

Torghatten, a Norwegian ferry operator, launched an autonomous ferry service in Stockholm.<sup>29</sup> The vessel, *MF Estelle*, was inaugurated on 8 June 2023. It is equipped with an autonomous operation system

created by Zeabuz, a technology supplier, and is navigating between Kungsholmen and Söder Mellarstrand.<sup>30</sup> The 12-metre electric ferry will run every 15 minutes for a period of 15 consecutive hours with a maximum capacity of 24 people. An operator will initially be present on board at all times, although the intention is to operate the vessel fully remotely in the future.<sup>31</sup>

## ADNOC L&S and SeaOwl to design crewless ships<sup>32</sup>

ADNOC L&S has entered into an agreement with SeaOwl for the design of unmanned vessels installed with automation systems. This initiative will promote the UAE and French companies’ decarbonisation incentives. The intention is for the vessels to be remotely operated from an onshore centre by a satellite link, and to be used for the transportation of “vehicles, equipment, and supplies to and from offshore sites”.<sup>33</sup> The AI systems on board the vessels will monitor “propulsion, dynamic positioning, remote communication and cyber security”.<sup>34</sup>

## BlueWhale: Israel’s unmanned submarine<sup>35</sup>

Israel Aerospace Industries is developing an AUV which will be deployed for covert intelligence-gathering operations. The AUV, enabled by its electric power to operate for 2-4 weeks, will be used to detect submarines and underwater targets, collect acoustic intelligence as well as “search for and detect naval mines on the seabed”.<sup>36</sup> The data collected will be swiftly transmitted via a satellite channel to a command centre.

## SAFE Boats, Mythos AI, Echo81 and World Marine Design introduce the *Merlin*<sup>37</sup>

This group collaboration is working towards the launch of *Merlin*, a 24-metre autonomous hydrographic survey vessel. The vessel will be Jones-Act compliant and is intended to be used for the purpose of supporting the US offshore wind sector. It is claimed to be “the industry’s first geophysical vessel with a fully integrated geophysical sensor suite”, which can be designed specifically for US offshore wind and can be acquired directly from the builder, SAFE Boats.<sup>38</sup>

## Autonomous vessel pilot project to launch in North Sea wind farm<sup>39</sup>

Northland Power and Subsea Europe Services will collaborate on a project this July, in which the latter will deploy the *Autonomous Surveyor* USV and *A.Ikanbilis* Hovering Autonomous Underwater Vehicle (**HAUV**) to conduct survey and inspection operations at the Deutsche Bucht Offshore Wind Farm. The USV will undertake “multibeam echosounder surveys

25 <https://www.fugro.com/media-centre/news/fulldetails/2023/04/13/fugro-s-expands-its-horizon-with-the-first-uae-flagged-uncrewed-surface-vessel>

26 <https://www.hfw.com/downloads/004825-HFW-MASS-Autonomous-Vessels-The-Momentum-Is-Building.pdf>

27 <https://www.fugro.com/media-centre/news/fulldetails/2023/04/13/fugro-s-expands-its-horizon-with-the-first-uae-flagged-uncrewed-surface-vessel>

28 <https://www.marineinsight.com/shipping-news/worlds-first-commercial-emission-free-autonomous-passenger-ferry-launched/>

29 Ibid.

30 <https://www.designboom.com/technology/electric-self-driving-ferry-stockholm-zeam-zeabuz-torghatten-04-25-2023/>

31 <https://www.rivieramm.com/news-content-hub/news-content-hub/torghatten-to-launch-autonomous-ferry-in-stockholm-74991>

32 <https://www.oedigital.com/news/505032-adnoc-l-s-seaowl-designing-unmanned-supply-vessels-for-offshore-operations>

33 Ibid.

34 Ibid.

35 [https://www.marineinsight.com/videos/new-unmanned-spy-submarine-bluewhale-to-strengthen-israels-naval-capabilities/?utm\\_source=rss&utm\\_medium=rss&utm\\_campaign=new-unmanned-spy-submarine-bluewhale-to-strengthen-israels-naval-capabilities](https://www.marineinsight.com/videos/new-unmanned-spy-submarine-bluewhale-to-strengthen-israels-naval-capabilities/?utm_source=rss&utm_medium=rss&utm_campaign=new-unmanned-spy-submarine-bluewhale-to-strengthen-israels-naval-capabilities)

36 Ibid.

37 <https://www.workboat.com/shipbuilding/safe-boats-to-market-autonomous-hydrographic-survey-vessel> and <https://maritime-executive.com/article/safe-designs-off-the-shelf-autonomous-survey-boat-for-jones-act-wind>

38 <https://splash247.com/new-jones-act-compliant-autonomous-survey-vessel-revealed/>

39 <https://www.subsea-europe.com/post/greenlight-for-autonomous-operations-maintenance-pilot-at-deutsche-bucht-offshore-wind-farm>

to monitor the Inter-Array Cable routes and potential scouring at the foundations”, whereas the HAUUV will undertake “general visual inspections of the foundations, from water level all the way down to the seabed”.<sup>40</sup>

## Legal perspectives

### MASS and the CMA CGM Libra decision

In May this year, Sir Nigel Teare, in his role as chairman of the Association of Average Adjusters, delivered a thought-provoking speech on the challenges posed by automation in shipping.<sup>41</sup> Focussing on the CMA CGM Libra decision, which held that a defective passage plan can render a vessel unseaworthy, he reasoned that passage planning considerations and implications would be applicable to MASS.<sup>42</sup> However, for the due diligence obligation of the owner under the Hague-Visby Rules to be triggered, the ship in question would still have to be in the owner’s control, which, in the case of MASS, could be linked to the possession of the relevant software. In his speech, Sir Nigel Teare also expressed his concerns about the potential replacement of masters and marine engineers by software engineers for the provision of expert evidence and offered his views on the interpretation of negligent navigation.

It is interesting to see that MASS are gradually becoming part of not just commercial, but also legal discussions, especially with reference to high-profile cases such as the *CMA CGM Libra*.

### MASS and regulation

Given the increasing focus on the regulation of MASS, we have prepared a separate update which summarises and clarifies the recent legal and regulatory changes and future considerations. HFW’s MASS Regulatory Update can be viewed at: <https://www.hfw.com/Mass-Update-Part-1-Regulations-Catching-up-with-technology>

<sup>40</sup> Ibid.

<sup>41</sup> <https://insurancemarinenews.com/insurance-marine-news/automated-ships-and-ai-will-raise-complex-liability-questions-says-sir-nigel-teare/>

<sup>42</sup> *Alize 1954 v Allianz Elementar Versicherungs AG* [2021] UKSC 51

## Past events

### Autonomous Ship Reality Webinar

8-10 March 2023

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.

[https://www.bigmarker.com/series/autonomous-ship-reality/series\\_details](https://www.bigmarker.com/series/autonomous-ship-reality/series_details)

### 6th Annual Uncrewed Maritime Systems Technology Conference

2 & 3 May 2023

<https://www.smgconferences.com/defence/archive/5-2023/conference/Unmanned-Maritime-Systems>

### Autonomous Ship Expo 2023

20-22 June 2023

HFW’s London Senior Associate & Mariner Jonathan Goulding spoke at the conference.

<https://www.bmt.org/events/n/6501/Autonomous-Ship-Expo-and-Conference-2023>

## Upcoming events

### Marine Autonomy and Technology Showcase 2023

7 & 9 November 2023

<https://10times.com/e12s-srfz-1p08>

**If you are interested in finding out more about HFW’s work in this area, or require guidance with respect to autonomous shipping matters, please feel free to reach out to our team.**



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