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CARRIAGE OF GOODS AND MARITIME AUTONOMOUS SURFACE SHIPS – THE LIABILITY OF THE CARRIER UNDER INTERNATIONAL SEA CARGO REGIMES

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Carriage of goods and autonomous ships – The liability of the carrier under international sea cargo regimes

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ABSTRACT

This paper examines the implications of Maritime Autonomous Surface Ships (MASS) for carrier liability under existing international cargo regimes. As uncrewed and remotely operated cargo vessels become increasingly likely, it assesses whether the existing international sea cargo regimes can accommodate operations in which onboard crews are replaced by shore-based Remote Operations Centres (ROCs).

It finds that the scope of application of all regimes is sufficiently broad to encompass MASS, as none requires a physical crew for a vessel to qualify as a 'ship'. More complex issues arise in relation to the carrier's core obligations, particularly the duty to exercise due diligence to make the ship seaworthy and the duty to properly and carefully care for cargo. In the context of MASS, seaworthiness must extend beyond the physical vessel to include the functionality, security, and reliability of ROCs, including the competence of remote operators, who are likely to be treated as the functional equivalent of crew. Although autonomous systems change how cargo is handled and monitored, they do not alter the applicable legal standards.

Uncertainty remains in relation to traditional defences, notably the nautical fault exception and the treatment of software errors and latent defects. While the existing regimes can accommodate autonomous shipping, they do so imperfectly. In the absence of reform, the targeted use of clauses in bills of lading offers the most pragmatic short-term response to the legal uncertainties posed by MASS.

Keywords: carriage of goods by sea, carrier liability, seaworthiness, cargo care, excepted perils, allocation of risk, limitation of liability, MASS

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1 Introduction

The technology enabling Maritime Autonomous Surface Ships (MASS) is rapidly advancing, and the commercial use of autonomous ships for cargo-carrying operations appears to be on the horizon. This paper, therefore, considers what, if any, issues arise for the application of international cargo regimes where crew are removed from onboard operations to ashore.

The focus of the discussion is chiefly on the Hague and Hague-Visby Rules with reference to the Hamburg Rules and Rotterdam Rules, which have both failed to replace the 100-year-old regime. The objective is to assess the impact the Rules will have on carrier liability and defences where carriage of goods by sea is on an uncrewed ship.

1.1 Definitions of MASS

Before the substantive discussion, it is perhaps helpful to cover some brief definitions. Those who have been closely watching the development of maritime autonomous surface ships (MASS) will be familiar with this taxonomy, but by way of reminder, the IMO has defined a MASS as a ship that can, to varying degrees, operate independently of human interaction.[1]

At the time of writing, Remote Operations Centres (ROCs) are being used to operate smaller craft. The ROC is a centre where a person or team of people can operate and monitor offshore vessels remotely. This requires constant connectivity between the ROC and the vessel via satellite, 4G, or fibre-optic cables.[2] The ROC is crucial for the successful operation of a voyage, and it has been described as embodying the heart of MASS operations.'[3]

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[1] The degrees of autonomy are, by now, familiar to many, but by way of reminder: Degree One: Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control. Degree Two: Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions. Degree Three: Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board. Degree Four: Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

[2] See, e.g., Oceaneering, Onshore Remote Operations Centers (OROCs) <https://www.oceaneering.com/remote-services/onshore-remote-operations-centers-orocs/#:~:text=Onshore%20Remote%20Operations%20Center%20(OROC,connectivity%20to%20ensure%20reliable%20support> 21 March 2026.

[3] R Glenn Wright, *Unmanned and Autonomous Ships: An overview of MASS* (Routledge 2020) 87.

For example, marine survey companies use uncrewed surface vessels (USVs) to conduct offshore inspections of subsea pipelines and offshore facilities. These USVs generally are around 12 metres in length and are operated remotely by human operators onshore in real time as if controlling from a conventional bridge.[4] These operations are categorised as Degree Three in the IMO taxonomy.

1.2 Cargo ships

In terms of cargo-carrying operations, a vessel that has received considerable publicity over the years is the *Yara Birkeland,* which has been operating in Norway's coastal waters since 2022. This is an electric cargo-carrying ship, and while it currently operates with an onboard crew, it uses autonomous systems in preparation for future fully autonomous voyages.[5] In addition, there are several ongoing projects which are preparing for the introduction of uncrewed cargo and passenger-carrying vessels. For example, Fjord1, the operator of a fleet of ferries in Norway, has ordered four ferries with a view to fully autonomous operations,[6] and in Japan, the Nippon Foundation's MEGURI 2040 project is in stage 2 toward achieving fully autonomous navigation by 2025.[7]

1.3 Autonomous operations

The motivations behind these projects vary, but in general, remote operations aim to be safer and lower-emission for surveying. For cargo and passenger carrying vessels, the drive to autonomy is due to an increasingly shrinking seafarer labour force,[8] an issue that it has been

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4 Fugro, 'Remote inspection services and autonomous solutions' <https://www.fugro.com/expertise/remote-and-autonomous-solutions>; News Editor, 'SAFEEN Subsea launches 12m USV for UAE offshore operations' MASS World, 2 November 2024 <https://massworld.news/safeen-subsea-launches-12m-usv-for-uae-offshore-operations/>; ACUA Ocean, Technology <https://www.ocean.tech/technology>; IKM Subsea AS 'Onshore Control Center' <https://www.ikm.com/ikm-subsea/products/services/onshore-control-center> accessed 21 March 2026.

5 See Naida Hakirevic Prevljak 'Yara Birkeland, world's 1st fully electric autonomous containership, marks 3 years in service' Offshore Energy 8 May 2025 <https://www.offshore-energy.biz/yara-birkeland-worlds-1st-fully-electric-autonomous-containership-marks-3-years-in-service/> accessed 21 March 2026.

6 Shippax, 'First tow of Fjord1's autonomously operated electric ferries launched' 7 November 2025 <https://www.shippax.com/en/news/first-two-of-fjord1s-autonomously-operated-electric-ferries-launched.aspx> accessed 21 March 2026.

7 The Nippon Foundation MEGURI 2024 Autonomous Ship Program <https://en.nippon-foundation.or.jp/what/projects/ocean/meguri2040> accessed 21 March 2026.

8 Mingyu Kim, Tae-Hwan. Joung, Byongug Jeong, and Han-Seon Park 'Autonomous shipping and its impact on regulations, technologies, and industries.' (2020) 4(2) J of Int'l Maritime Safety, Environmental Affairs, and Shipping 17.

argued could be exacerbated by the increase in ROCs, as experienced seafarers could be poached from an already shrinking pool to train ROC operators.[9] Other perceived benefits include reduced operational, voyage, and crew costs, and the potential to integrate MASS into the Internet of Things (IoT) across logistics and supply chains.[10]

Unlike conventional ships, when a MASS is operating at degrees three and four, the ship is navigated and monitored by an operator in a different location rather than being on board. The IMO is developing a regulatory framework for the safe operation of MASS[11] and explicitly stated that a MASS must have a human master regardless of the mode of operation, including remote operations.

So, this means there will be a person responsible for the vessel's operations in a completely different location from the vessel itself. This responsibility could be to actually navigate the ship itself, which would reflect degree 3 level of autonomy; or if the ship is navigating at degree 4, then the person would be monitoring from either a shore-based location or potentially on board another ship.

There is also the possibility that this person, defined as the master, will be responsible for more than one vessel at the same time. So, while there will only be one master per ship, this person may be the master of three or four ships simultaneously.[12]

This is a potentially novel operation for the international carriage of goods by sea. We are not there yet, but it is worth considering how the existing international maritime cargo regimes would function when the crew is taken from on board the ship to shore.

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9 T Karilis, 'Maritime Law Issues Related to the Operation of Unmanned Autonomous Cargo Ships' (2018) 17 WMU J of Maritime Affairs 119, 123.

10 Anastasia Tsvetkova and Magnus Hellström 'Creating Value Through Autonomous Shipping: An Ecosystem Perspective' (2022) 24 Maritime Economics and Logistics 255.

11 IMO, Report of the Joint MSC-LEG-FAL Working Group on Maritime Autonomous Surface Ships (MASS-JWG) 2nd session 'Development of a Goal Based Instrument for Maritime Autonomous Surface Ships (MASS)' MSC 107/5/1, 2 May 2023.

12 The technical capability to do this is rapidly developing. See Rob O'Dwyer, 'Massterly reaches three-vessel simultaneous remote supervision by single technician' Smart Maritime Network, 5 March 2026 <Massterly reaches three-vessel simultaneous remote supervision by single technician - Smart Maritime Network> accessed 11 March 2026.

This paper draws comparisons between the Hague and Hague Visby Rules, the Hamburg Rules and the Rotterdam Rules, to generally identify how each regime would accommodate cargo-carrying MASS. The three broad questions asked are the scope of the application of the convention, how a carrier will fulfil its obligations when the ship is uncrewed, and how the carrier's liability will be determined.

2 The scope of the Conventions

The first issue is what the scope of the convention is, and whether it applies to remote operations. This is straightforward and unproblematic.

The International Convention for the Unification of Certain Rules of Law relating to Bills of Lading 1924 (Hague Rules) and the Protocol of 1968 (Hague-Visby Rules) apply to a contract of carriage covered by a bill of lading or any similar document of title[13] from the period of time the goods are loaded onto the ship to the time they are discharged from the ship.[14] A 'ship' is defined as any vessel used for the carriage of goods by sea.[15] A remotely operated craft is a vessel used to carry goods by sea, since nothing requires a crew to be on board for a ship to be a ship. Therefore, even if the operational navigation of the vessel is a different location, provided a bill of lading is issued in a contracting state, or the carriage is from a contracting state, or if they are contractually incorporated, the Hague Rules apply.[16]

The United Nations Convention on the Carriage of Goods by Sea 1978 (Hamburg Rules), do not contain a definition of 'ship' but provide that '"Carrier" means any person by whom or in whose name a contract of carriage of goods by sea has been concluded with a shipper' and '"[a]ctual carrier" means any person to whom the performance of the carriage of the goods, or of part of the carriage, has been entrusted by the carrier, and includes any other person to whom such performance has been entrusted.'[17] Again, provided a bill of lading is issued and is issued in a contracting state or the port of loading or discharge is in a contracting state, the

[13] Art I(b).
[14] Ibid, art I(e).
[15] Ibid, art I(d).
[16] Ibid, art X.
[17] Art 1(1)-(2).

Hamburg Rules would apply.[18] There is nothing in the text that would preclude a remotely operated ship from being covered.

The United Nations Convention on Contracts of Carriage of Goods Wholly or Partly by Sea (Rotterdam Rules) will also apply. '"Ship" means any vessel used to carry goods by sea';[19] therefore, a remotely operated vessel or a fully autonomous vessel can meet that definition. There is no requirement that there be an onboard crew for it to be a ship.

None of the conventions applies to charterparties,[20] but can be contractually incorporated or apply when the holder of the bill of lading is not the charterer. Many standard-form charterparties contain a paramount clause that incorporates the Hague Rules.[21]

3 Seaworthiness

When the navigational crew is removed from a vessel and taken onshore, the carrier will need to know what is required to meet its seaworthiness obligations.

3.1 Seaworthiness – The Hague (and Hague-Visby) Rules, Hamburg Rules and Rotterdam Rules

Article III, rule 1, of the Hague (and Hague-Visby) Rules specifies that the carrier shall be bound *before and at the beginning* of the voyage to exercise *due diligence* (emphasis added) to:

> (a) Make the ship seaworthy; and
>
> (b) Properly man, equip and supply the ship.

This obligation does not require an absolute undertaking of seaworthiness, but rather that the carrier shall exercise due diligence to ensure the ship is seaworthy. However, a leading scholar

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[18] Ibid, art 2(1). Generally, on the Hamburg Rules, see Samir Mankabady (ed), *The Hamburg Rules on the Carriage of Goods by Sea* (Sijthoff 1978); Francis D Rose & FMB Reynolds, *Carver on Bills of Lading* (5th edn, Sweet & Maxwell 2022) ch 10.

[19] Art (1)(25).

[20] Hague (and Hague-Visby) Rules, art V; Hamburg Rules, art 2(3); Rotterdam Rules, art 6(1).

[21] See, for example, Asbatankvoy (and Asbtankvoy 2025), cl 20(b)(i); NYPE 93, cl 31(a) (NYPE 2015, cl 33(a)), Gencon 1994, cl 10 (Gencon 2022, cl 19) requires that bills of lading are presented as per the Congenbill bill of lading form. Congenbill 2016 contains a general paramount clause incorporating the Hague-Visby Rules (cl 2).

has pointed out that the carrier may be subject to an absolute undertaking of seaworthiness if the Rules are contractually incorporated. The Carriage of Goods by Sea Act 1971 (UK), which gives the force of law[22] to the Hague-Visby Rules, states:

> There shall not be implied in any contract of carriage of goods by sea to which the Rules apply by virtue of this Act any absolute undertaking by the carrier of the goods to provide a seaworthy ship.[23]

The words 'by virtue of this Act' clarify that if the Rules do not apply by force of law but are contractually incorporated, then an absolute undertaking of seaworthiness may be implied.[24]

The Hamburg Rules do not contain a seaworthiness provision, but Art 5(1) provides the basis of liability:[25]

> The carrier is liable for loss resulting from loss of or damage to the goods, as well as from delay in delivery, if the occurrence which caused the loss, damage or delay took place while the goods were in his charge as defined in article 4, unless the carrier proves that he, his servants or agents took all measures that could reasonably be required to avoid the occurrence and its consequences.

This is fault-based liability with the burden of proof placed upon the carrier, or in other words, the carrier is presumed to be at fault in the event of loss, damage or delay[26] unless such loss results from measures to save life at sea or reasonable measures to save property at sea.[27]

The Rotterdam Rules provide that:[28]

> The carrier is bound before, at the beginning of, and during the voyage by sea to exercise due diligence to:

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22 See s 1(2). See Carver (n 18) [9-075]; [9-078].
23 Ibid, s 3.
24 Stephen Girvin, *Carriage of Goods by Sea* (3rd edn, OUP 2022) [27.17].
25 See JF Wilson, 'Basic Carrier Liability and the Right of Limitation' in Mankabady (n 18) 137.
26 With the exception of fire. Art 4(a) requires the claimant to prove that the fire arose due to fault or neglect on the part of the carrier. See below, para 5.3; Carver (n 18) [10-008].
27 Art 6. See JC Sweeney, 'Article 6 of the Hamburg Rules' in Mankabady (n 18) 151.
28 Art 14.

(a) Make and keep the ship seaworthy;

(b) Properly crew, equip and supply the ship and keep the ship so crewed, equipped and supplied throughout the voyage.

While both the Hague Rules and the Rotterdam Rules have an express seaworthiness requirement, the duty under the Hague Rules only applies before and at the beginning of the voyage, whereas there is a continuing obligation under the Rotterdam Rules. Neither convention makes seaworthiness an absolute requirement; it is the exercise of due diligence that must be satisfied for the carrier to have met their obligation and for the carrier to rely on the exceptions from liability in Art IV, rule 2 of the Hague Rules and Art 17(3) of the Rotterdam Rules.

3.2 Seaworthiness and MASS operations

In the context of MASS operations, this requires consideration of what is meant by seaworthiness. Is it the craft or the vessel itself, or does it extend to a shore-based remote operation centre? It is preferable that the obligation extend to operations and the crew in the ROC, although not every aspect of the building will be relevant.

In *The Good Friend*,[29] Staughton J stated:

> I think the word 'seaworthy' in The Hague Rules is used in its ordinary meaning, and not in any extended or unnatural meaning. It means that the vessel – with her master and crew – is herself fit to encounter the perils of the voyage and also that she is fit to carry the cargo safely on that voyage.[30]

The seaworthiness obligation is therefore what is recognised at common law in the Hague Rules and in the Rotterdam Rules, which do not change the aspects of seaworthiness.[31] This

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[29] *Empresa Cubana Importada de Alimentos Alimport v Iasmos Shipping Co SA (The Good Friend)* [1984] 2 Lloyd's Rep 586.

[30] Ibid, 592.

[31] See UNCITRAL Consolidated Official Reports on the Preparation of the United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea (The Rotterdam Rules) at p 157: 'The Commission took note of that view and of the countervailing view, for which there was some support, that the draft article still set the carrier's liability at a low standard, as it contemplated only an obligation to exercise due diligence to make the ship seaworthy, rather than a firm obligation to provide a seaworthy ship. In that connection, there was not sufficient support for a proposal to qualify the carrier's due diligence

means that the 'ship must have that degree of fitness which an ordinary careful owner would require his vessel to have at the commencement of her voyage having regard to all the probable circumstances of it'.[32]

There is no single definition of seaworthiness despite being an implied obligation at common law for all contracts of affreightment. In *Kopitoff v Wilson*, Field J explained:

> [I]n whatever way a contract for the conveyance of merchandise be made, where there is no agreement to the contrary, the shipowner is, by the nature of the contract, impliedly and necessarily held to warrant that the ship is good, and is in a condition to perform the voyage then about to be undertaken, or, in ordinary language, is seaworthy, that is, fit to meet and undergo the perils of the sea and other incidental risks to which she must of necessity be exposed in the course of the voyage.[33]

This means that a seaworthy vessel must be structurally fit for the intended voyage. A ship will not be seaworthy if there 'is some attribute of the ship' itself that makes it unseaworthy.[34] This does not mean that seaworthiness is subject to an 'attribute threshold' but rather the attributes of the ship can be illustrative of unseaworthiness.[35] Connected to this, seaworthiness also requires the ship's equipment to be in working order, including its engines.[36]

This will require the ROC to be similarly structurally fit for the intended voyages. The security of the ROC is paramount, especially if it is monitoring and navigating several ships simultaneously. In addition to the physical risks that conventional ships face, potential threats to MASS operations extend to land-based procedures. These will include physical risks to the

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obligations to provide a seaworthy ship by including a reference to 'prevailing standards of maritime safety'. <https://uncitral.un.org/sites/uncitral.un.org/files/media-documents/uncitral/en/compilation_of_reports.pdf>, accessed 8 March 2026. See also Michael F Sturley et al, *The Rotterdam Rules: The UN Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea* (2nd edn, Sweet & Maxwell 2020) [5-020].

32 *McFadden v Blue Star Line* [1905] 1 KB 697, 706 (Channell J) (quoting TG Carver, *A Treatise on the Law Relating to the Carriage of Goods by Sea* (3rd edn, Stevens & Sons Ltd 1900) 20-21).

33 (1876) 1 QBD 377, 380.

34 *A Meredith Jones & Co v Vangemar Shipping Co Ltd (The Apostolis)* [1997] 2 Lloyd's Rep 241 (CA), 257.

35 See Lord Hamblen JSC's discussion in *Alize 1954 v Allianz Elementar Versicherungs AG (The CMA CGM Libra)* [2021] UKSC 51, [2021] 2 Lloyd's Rep 613, [86]-[96].

36 *MT Cape Bonny Tankschiffahrts GmbH & Co KG v Ping An Property and Casualty Insurance Co of China Ltd, Beijing Branch (The Cape Bonny)* [2017] EWHC 3036 (Comm), [2018] 1 Lloyd's Rep 356.

building, such as fire or flood, as well as cyber-attacks on the systems in the ROC. Of course, commercial ships are also at risk from cyber-attacks, but so far, these attacks have not affected the essential control systems of those ships.[37] MASS operations rely on secure computer systems and communication networks. Any attack on the ROC and its communication networks would be 'devastating'.[38] Therefore, it is logical that the duty to exercise due diligence to ensure the ship is seaworthy must extend to ensuring that the ROC has proper cybersecurity and backup systems in place to safeguard the MASS in the event of a cyber-attack.[39] The required standards are likely to be measured against the forthcoming IMO MASS Code, which, at the time of writing, is being drafted by the IMO Maritime Safety Committee.[40]

3.3 Seaworthiness and crews

In addition to the physical attributes of the ship, seaworthiness also extends to proper crewing, which demands that the crew is sufficient in number and competency.[41] In the context of MASS, there may be no humans on board the ship, rather sensors and automated systems will provide feedback to the ROC. In *Hongkong Fir Shipping Co Ltd v Kawasaki Kisen Kaisha Ltd*[42] Sellers LJ highlighted that a ship's crew may be 'competent and efficient notwithstanding numerical deficiency'.[43] However, ROC operators will be considered crew and required to be competent[44] and sufficient in number for the vessel to be considered seaworthy. This means that the operators will be required to be qualified and trained to operate the vessel or vessels safely.[45]

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37 Wright (n 3) [8.6].

38 Ibid.

39 The 2017 NotPetya cyber-attack on Maersk shut down their operations for 10 days at an estimated cost of $250 and $300 million USD. See A Greenberg, 'The Untold Story of NotPetya, the Most Devastating Cyber Attack in History' Wired Magazine, September 2018 <https://www.wired.com/story/notpetya-cyberattack-ukraine-russia-code-crashed-the-world/> accessed 15 March 2026.

40 International Maritime Organisation, Autonomous Shipping: <https://www.imo.org/en/mediacentre/hottopics/pages/autonomous-shipping.aspx> accessed 15 March 2026.

41 *Hongkong Fir Shipping Co Ltd v Kawasaki Kisen Kaisha Ltd* [1962] 2 QB 26 (CA), 64 (Upjohn LJ).

42 Ibid.

43 Ibid, 55.

44 Incompetence or inefficiency may consist of a 'disabling want of skill' or a 'disabling want of knowledge' *Papera Traders Ltd v Hyundai Merchant Marine Co Ltd (The Eurasian Dream)* [2002] EWHC 118 (Comm); [2002] 1 Lloyd's Law Rep 719, [129].

45 For the current training requirements in the United Kingdom for ROC operators, see Maritime & Coastguard Agency 'Remote Operator Training and Certification Framework Training Record Book' June 2025

A crew member may be incompetent notwithstanding having proper qualifications. In *The Makedonia*,[46] Hewson J[47] expressed the view that

> in considering efficiency, the matters to be considered, in my view, are not limited to a disabling want of skill and a disabling want of knowledge. A man may be well qualified and hold the highest grade in certificates of competency and yet have a disabling lack of will and inclination to use his skill and knowledge so that they are well-nigh useless to him. Such a man may be unable efficiently to use the skill and knowledge which he has through drunken habits or through ill-health.

This means that to meet that in exercising due diligence to make the ship seaworthy, 'a prudent owner would have required the relevant defect (in this case the competence of the master), had he known of it, to be made good before sending his ship to sea'.[48]

3.4 Seaworthiness as a non-delegable duty

Under the Hague and Hague-Visby Rules, if responsibilities are delegated to independent contractors and they are negligent, the carrier remains liable.[49] The carrier may not argue that it engaged reliable experts or lacked the necessary expertise to check their work.[50] The only limits on the carrier's obligation are where the defaults of others took place before the carrier became responsible for the ship. In *The Muncaster Castle*, a case where the Hague Rules applied, Lord Radcliffe[51] set out that:

> The carrier's responsibility for the work itself does not begin until the ship comes into his orbit, and it begins then as a responsibility to make sure by careful and skilled inspection that what he is taking into his service is in fit condition for the purpose and, if there is anything lacking that is fairly discoverable, to put it right. This is recognised in the judgment. But if the bad work that has been done is 'concealed' and so cannot

<https://assets.publishing.service.gov.uk/media/68650859b24f7b12e1a07270/07._RO_TRB_P2__1_.pdf> accessed 15 March 2026.

46 [1962] 1 Lloyd's Rep 316.

47 Ibid, 335.

48 *Unity Ship Group SA v Euroins Insurance JSC (The Happy Aras)* [2026] EWHC 7 (Admlty), [2026] 1 Lloyd's Rep 151.

49 *Riverstone Meat Co Pty Ltd v Lancashire Shipping Co Ltd (The Muncaster Castle)* [1961] AC 807 (HL).

50 Girvin (n 24) [27.21].

51 *The Muncaster Castle* (n 49) 868, citing *W Angliss & Co (Australia) Pty Ltd v Peninsular and Oriental Steam Navigation Co* [1927] 2 KB 456.

> be detected by any reasonable care, then the lack of diligence to which unseaworthiness is due is not to be attributed to the carrier.

This test may be relevant to MASS with respect to programming errors or software faults that may be undetectable and considered latent defects. A carrier may avoid a claim under Art III, rule 1, if it can show that there is a latent defect arising from the construction of the vessel. However, it must produce evidence that no defect was discovered during inspections carried out by surveyors, provided the survey is conducted with care and skill.[52]

If, therefore, the ROC is deemed to be part of the ship for seaworthiness requirements, which it surely must be, as, although it has been disputed that this is the functional equivalent of the bridge,[53] the ship cannot (or should not) navigate without supervision of its voyage from the ROC. As a lack of equipment on the ship itself capable of communicating with the ROC would render the ship unseaworthy,[54] it follows that there will have to be some form of inspection and probably licensing or a survey of the ROC itself in order for the carrier to meet its due diligence requirements.[55] That 'exercise of due diligence is the exercise of reasonable care and skill: "Lack of due diligence is negligence"'.[56]

The duty of due diligence to provide a seaworthy vessel does not extend to responsibility for manufacturers, exporters, or shippers.[57] This means the carrier does not have to check what is being shipped, and can rely on the shipper's declaration.[58] However, a failure of due diligence by the master and officers has never been held to be outside the orbit of the carrier's responsibility, and 'it is hard to think that there would be.'[59]

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52 *Union of India v NV Reederij (The Amstelslot)* [1963] 2 Lloyd's Rep 223 (HL).

53 Bűlent Sòzer, 'Control Centres in the Context of Unmanned Ship Operations – Their Status and Potential Liaiblities' in Barış Soyer and Andrew Tettenborn (eds), *Damages Recoveries and Remedies in Shipping Law* (Informa 2023) 142.

54 Ibid.

55 Classification societies are developing guidelines for autonomous and remotely operated vessels, see for example DNV GL, 'DNV launches class notations to provide framework for safe development of autonomous shipping technologies' 15 January 2025 <https://www.dnv.com/news/2025/dnv-launches-class-notations-to-provide-framework-for-safe-development-of-autonomous-shipping-technologies/> accessed 15 March 2026.

56 *The Eurasian Dream* (n 44) [131], citing *The Amstelslot* (n 2) 235 (Lord Devlin).

57 Girvin (n 24) [27.21].

58 *Northern Shipping Co v Deutsche Seereederei GmbH (The Kapitan Sakharov)* [2000] 2 Lloyd's Rep 255.

59 Girvin (n 24) [27.21].

This view is supported by the reasoning of the Supreme Court in *The CMA CGM Libra*.[60] The case concerned the scope of the carrier's obligation to make a ship seaworthy under the Hague Rules and whether there is a distinction between the carrier's seaworthiness obligation and the navigation of the vessel. The cargo had been carried under bills of lading governed by the Hague Rules. While leaving the port of Xiamen in China, the vessel grounded. The carrier sought contribution in general average from the cargo interests claiming that the casualty was due to an uncharted shoal outside the fairway where the ship grounded. The cargo interests refused to contribute, arguing that the cause of the casualty was the unseaworthiness of the ship because of a defective passage plan which led to the master's negligent navigation. This unseaworthiness meant a breach of Art III, rule 1, of the Hague Rules, and therefore they were not liable to contribute in general average. The trial judge (Teare J) held that the passage plan was defective and that seaworthiness extends to 'the presence on board a vessel of an appropriate chart',[61] thus, as the passage plan was defective and causative of the grounding, the claim was dismissed.

The Court of Appeal upheld Teare J's judgment and similarly dismissed the owners' appeal,[62] Haddon-Cave LJ explaining that the Hague Rules allocate the risk for maritime adventures into two separate regimes. The first regime imposes a duty to exercise due diligence to make the ship seaworthy, 'before and at the beginning of the voyage'.[63] 'The second regime excuses the carrier from liability for loss or damage caused by errors of crew or servants 'in the navigation or in the management of the ship' *thereafter*, i.e. during the voyage (Art IV, rule 2(a)) … to elide these two separate regimes [is] heterodox'.[64]

Lord Hamblen JSC (with whom Lord Reed, Lord Briggs, Lady Arden, and Lord Leggatt agreed) dismissed the appeal and stated:[65]

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60 Above (n 35).

61 *Alize 1954 v Allianz Elementar Versicherungs AG (The CMA CGM Libra)* [2019] EWHC 481 (Admlty), [2019] 1 Lloyd's Rep 595, 607.

62 *Alize 1954 v Allianz Elementar Versicherungs AG (The CMA CGM Libra)* [2020] EWCA Civ 293, [2020] 2 Lloyd's Rep 565.

63 Art III, r 1.

64 *The CMA CGM Libra* (n 61) [102]-[103].

65 Above (n 35) [137].

> The work of preparing a proper passage plan so as to make the vessel seaworthy for the voyage was entrusted to the master and deck officers, who are the owners' servants. It was they who were 'implicated by the carriers in the work of keeping or making the vessel seaworthy' in relation to passage planning. As such, the owners 'must answer for anything that has been done amiss in the work'.

Lord Hamblen JSC concluded by affirming that the 'crew's failure to navigate the ship safely is capable of constituting a lack of due diligence by the carrier.'[66] It does not matter that the task delegated to the master to make the ship seaworthy involves navigation. In other words, if negligent navigation is the cause of the unseaworthiness, the carrier has not met its obligation. A defective passage plan involves fault or neglect 'in the navigation of the ship',[67] but that is 'no defence to a claim for a loss or damage caused by unseaworthiness.'[68]

Following the *Muncaster Castle*[69] and the Supreme Court's reasoning in *The CMA CGM Libra*,[70] where the carrier opts to use a third-party provider of remote operation navigation and supervision services, that provider would be considered an agent or servant of the carrier, and the carrier will not be relieved of the obligation to exercise due diligence to make the ship seaworthy and the ROC seaworthy. However, the contract may provide that the third-party provider of ROC services indemnify the carrier in the event of its negligence, albeit with some restrictions. An example of such a clause can be found in BIMCO's standard form ship management agreement for MASS, 'AUTOSHIPMAN', which provides:

> (b) Liability to Owners
>
> (i) Without prejudice to subclause (a),[71] the Managers shall be under no liability whatsoever to the Owners for any loss, damage, delay or expense of whatsoever nature, whether direct or indirect, (including but not limited to loss of profit arising out of or in connection with detention of or delay to the Vessel) and howsoever arising in the course of performance of the Management Services UNLESS same is proved to have resulted solely from the negligence, gross negligence or wilful default of the

66 Ibid, [145].
67 Art IV, r 2(a).
68 Above (n 35) [145 (vii)].
69 Above (n 49) 868.
70 Above (n 35).
71 Subclause (a) is a force majeure clause.

> Managers (including their Affiliates) or their employees or agents, or subcontractors employed by them in connection with the Vessel, in which case (save where loss, damage, delay or expense has resulted from the Managers' personal act or omission committed with the intent to cause same or recklessly and with knowledge that such loss, damage, delay or expense would probably result) the Managers' liability for each incident or series of incidents giving rise to a claim or claims shall never exceed a total of ten (10) times the annual management fee payable hereunder.
>
> (ii) Acts or omissions of the Crew – Notwithstanding anything that may appear to the contrary in this Agreement, the Managers shall not be liable for any acts or omissions of the Crew, even if such acts or omissions are negligent, grossly negligent or wilful, except only to the extent that they are shown to have resulted from a failure by the Managers to discharge their obligations under Clause 5 (Crew Management and Crew Insurances) subclause (a) or Clause 7 (ROC and ROC Management and Insurance) subclause (b)(iv), in which case their liability shall be limited in accordance with the terms of this Clause.

It is worth noting that subclause (b)(ii) purports to relieve the Managers from any liability for the negligence of the crew. The definitions section provides:

> 'Crew' means the Seafarers and the ROC Operators of the numbers, rank and nationality specified in Annex B (Details of Crew) hereto.

If the ROC Operators are the employees of the managers, prima facie, subclause (b)(ii) conflicts with subclause (b)(i). However, this could be interpreted as two independent regimes. If the manager delegates one of its duties under the contract to a ROC operator qua 'crew', then subclause (b)(i) would apply. If the ROC operator is negligent in carrying out the functions for which they are employed, for example, navigating, then subclause (b)(ii) could apply in much the same way as the Supreme Court in *The CMA CGM Libra.*[72] Put simply, the duty to exercise due diligence to make the ship seaworthy, even if the act of making the ship seaworthy involves matters of navigation, is non-delegable, while errors of navigation attributable to the crew during the voyage are.

[72] *The CMA CGM Libra* (n 35).

Under the Hague (and Hague-Visby) Rules, Art IV, rule 1 provides:

> Neither the carrier nor the ship shall be liable for loss or damage arising or resulting from unseaworthiness unless caused by want of due diligence on the part of the carrier to make the ship seaworthy, and to secure that the ship is properly manned, equipped and supplied, and to make the holds, refrigerating and cool chambers and all other parts of the ship in which goods are carried fit and safe for their reception, carriage and preservation in accordance with the provisions of paragraph 1 of Article III. Whenever loss or damage has resulted from unseaworthiness the burden of proving the exercise of due diligence shall be on the carrier or other person claiming exemption under this article.

Article IV, rule 1, therefore restates the obligation in Art III, rule 1, and indicates the burden of proving due diligence has been exercised is placed on the carrier, although it is accepted that the common law burden of proof is transposed into the Hague Rules.[73] In *Minister of Food v Reardon Smith Line Ltd,* McNair J stated:[74]

> Art IV, r 1, strongly supports the submission made on behalf of the ship that no onus as to seaworthiness is cast on the shipowner, except after proof has been given by the other party that the damage has resulted from unseaworthiness.

The conventional approach to the burden of proof of a cargo claim was further set out by McNair J as follows:[75]

> the cargo-owner first has to make out a *prima facie* case of liability which is sufficient to cast upon the ship the obligation of shifting that onus by proving that the damage was caused by some matter falling within the exceptions, and then if the cargo-owner in turn wishes to deprive the shipowners of that protection, it is for the cargo-owner to establish affirmatively (a) that the ship was unseaworthy, and (b) that that unseaworthiness caused the damage.

Once the cargo-owner has established unseaworthiness and causation, the carrier may raise the defence that it exercised due diligence to make the ship seaworthy before, and at the

[73] Girvin (n 24) [27.29].
[74] [1951] 2 Lloyd's Rep 265, 272.
[75] Ibid, 271.

beginning of the voyage. There is a counter argument that this 'long route' to disproving fault is no longer the correct approach and should be reconciled using bailment, following the Supreme Court's approach in *Volcafe Ltd v Cia Sud Americana de Vapores SA (trading as CSAV)*,[76] which determined that the burden of proof under Art III, rule 2, is reconciled according to bailment.[77]

Whichever approach courts choose to take in relation to Art III, rule 1, displacement of this burden is relevant in the context of ROCs, as the standard of reaching the threshold of due diligence will be assessed by what would be expected of a reasonable ROC rather than the reasonable owner of a conventional ship. A proper system of passage planning is assessed against the IMO Guidelines for Voyage Planning (IMO Resolution A.893(21)[78] and therefore standards for ROCs are likely to be assessed by reference to the MASS Code, which at the time of writing is under review by the IMO.[79] However, several classification societies have provided guidelines for remotely operated vessels[80] and domestic regulations covering remote maritime operations are being rolled out.[81]

Under the Rotterdam Rules, the seaworthiness obligation is ongoing.[82] Given that the ship will be under constant monitoring from an onshore location, this is arguably a reasonably easy obligation to meet in relation to the ROC (if the ROC is included in that seaworthiness requirement). This means that if the ROC becomes what would be considered unseaworthy, for example, if communications are lost from the ROC or there is an incident in the ROC, such

[76] 'Volcafe' [2018] UKSC 61, [2019] AC 358.

[77] David Gibbs-Kneller, 'Onus Probandi under the Hague-Visby Rules Article III.1 sea cargo claims: did *The Volcafe* alter the structure?' (2021) 26(6) JIML 409.

[78] *The Happy Aras* (n 48).

[79] International Maritime Organisation, Autonomous Shipping <https://www.imo.org/en/mediacentre/hottopics/pages/autonomous-shipping.aspx> accessed 15 March 2026.

[80] For example, IR Class (Indian Register of Shipping) 'Guidelines on Remotely Operated Vessels and Autonomous Surface Vessels) Rev 1 December 2022 <https://www.irclass.org/media/7344/guidelines-on-remotely-operated-vessels-autonomous-surface-vessels_rev01_dec-2022.pdf> accessed 16 March 2026; DNV Guideline DNV-CG-0264, see <https://www.dnv.com/news/2025/dnv-launches-class-notations-to-provide-framework-for-safe-development-of-autonomous-shipping-technologies/> accessed 16 March 2026.

[81] UK Gov

[82] Art 14. See Sturley (n 31) [5-023].

as a fire or flood, the carrier will need to prove that they exercised due diligence in maintaining the ROC itself.

If the vessel becomes unseaworthy, for example, if a fire breaks out, it is holed, or damaged in some way, or communications are lost, and there is no crew on board to remedy the unseaworthiness, then the carrier will be required to arrange assistance for the vessel. This could be by the ROC operator, or the onboard computers may automatically call for assistance.[83] The lack of onboard crew available to remedy unseaworthiness could potentially render the vessel unseaworthy in and of itself.

If the cargo necessitates specific care that requires an onboard crew, this could also be considered a breach of the obligation to exercise due diligence to ensure seaworthiness[84] as being unfit to carry the cargo safely will amount to unseaworthiness even if the vessel itself would be safe to complete the voyage.[85] In *Stanton v Richardson*, Brett J explained:[86]

> It is found that the cargo offered was a reasonable cargo, and that the ship was not fit to carry a reasonable cargo…It seems to me that the obligation of the shipowner is to supply a ship that is seaworthy in relation to the cargo which he has undertaken to carry.

4 Duty to care for cargo

The cargoworthiness obligation is closely connected to the carrier's duty to care for cargo. At common law, this duty arises both contractually and in bailment.[87] The carrier as a bailee of the goods must take reasonable care of the goods and protect them from damage or loss.[88] The Hague (and Hague-Visby) Rules, Hamburg Rules, and Rotterdam Rules similarly contain provisions imposing a duty to care for cargo on the carrier, which will be examined individually below. This duty of due care is found in Art III, rule 2, of the Hague (and Hague-Visby) Rules:

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[83] Mikis Tsimplis, 'Carriage of Goods on Autonomous Ships' in Stephen Girvin and Vibe Ulfbeck (eds) *Maritime Organisation, Management and Liability: A Legal Analysis of New Challenges in the Maritime Industry* (Hart 2021) 289-290.

[84] Ibid, 297.

[85] Simon Baughen, *Shipping Law* (8th edn, Routledge 2023) 88.

[86] *Stanton v Richardson* (1872) LR 7 CP 421.

[87] *Notara v Henderson* (1872) LR 7 QB 225, 230; *East West Corp v DKBS 1912 A/S v P&O Nedlloyd BV* [2003] EWCA Civ 83, [2003] QB 1509.

[88] Girvin (n 24) [24.49].

'Subject to the provisions of Article 4, the carrier shall properly and carefully load, handle, stow, carry, keep, care for, and discharge the goods carried'. Although this is the rule, the common law position 'is an essential part of the legal background'[89] which means that under English law, the carriage of goods by sea is a bailment for reward on the terms of the bill of lading. The carrier is not, therefore, the insurer of the goods but has the legal burden of proving the absence of negligence if the goods are lost or damaged.[90]

This was confirmed by the Supreme Court decision in *Volcafe*.[91] However, the decision has received a mixed response from academics and judges. One view is that it is simple and clear, providing certainty,[92] while others have argued that it is inappropriate to take the bailment approach in the context of an international convention[93] and loses sight of the 'fact that the Rules are contained in an international convention designed to promote the unification of domestic law of contracting parties'.[94] It has been criticised as 'doctrinally unsound' and may lead to different outcomes in other jurisdictions, which would undermine the purpose of the Rules.[95]

In any event, if the contract of carriage is subject to English law, then the carrier has the burden to prove that it did 'properly and carefully load, handle, stow, carry, keep, care for, and discharge the goods carried.' If the carrier cannot establish this, they will be liable for the loss or damage unless the carrier can establish the loss or damage was caused by one of the Art IV, rule 2, exceptions.

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89 *Volcafe* (n 76). See also [2016] EWCA Civ 1103, [2017] QB 915, [7].

90 Ibid, [9].

91 Ibid.

92 Paul Todd, 'The Hague Rules and the Burden of Proof' [2019] LMCLQ 183, 189.

93 Stephen Girvin, 'The Carrier's Fundamental Duties to Cargo Under the Hague and Hague-Visby Rules' (2019) 25(6) JIML 443, 461.

94 Girvin (n 24) [27.51].

95 Justice Angus Stewart, 'The Fluctuating Incidence of the Burden of Proof Under the Hague-Visby Rules: The Implications of *Volcafe Ltd and others v Cia Sud Americana de Vapores SA (trading as CSAV)* [2019] AC 358 for the Position in Australia?' (2019) 95 ALJ 126, 137.

Article III, rule 2, does not mean that the carrier *must* load, stow and discharge the goods. This can be contractually agreed,[96] as explained by Devlin J, in *Pyrene Scindia Ltd v Scindia Navigation Co Ltd*:[97]

> It is difficult to believe that the rules were intended to impose a universal rigidity in this respect, or to deny freedom of contract to the carrier. The carrier is practically bound to play some part in the loading and discharging, so that both operations are naturally included in those covered by the contract of carriage. But I see no reason why the rules should not leave the parties free to determine by their own contract the part which each has to play. On this view the whole contract of carriage is subject to the rules, but the extent to which loading and discharging are brought within the carrier's obligations is left to the parties themselves to decide.

Loading and discharging onto a remotely operated or autonomous ship may be done in the same way as on a conventional ship if a caretaker crew is on board. Challenges arise if there is no crew and the loading, stowage and discharge of goods is also automated. If this obligation is not contracted to the shipper or consignee, the carrier will need to ensure and prove that the operating systems employed were appropriate for the type of cargo and that the software systems can be integrated with the shipboard system, which, in turn, can enable remote monitoring. These systems will develop with the technology, meaning the legal analysis of the standard expected of a reasonable carrier will also change. However, this duty to properly and carefully load, stow, and discharge does not preclude uncrewed or remote operations; it simply alters how these activities will be performed and by whom. It does not alter the liability regime.

The carrier must 'properly and carefully' care for the goods. This means in accordance with a 'sound system'.[98] In *Albacora SRL v Westcott & Laurence Line*, Lord Reid further stated that 'properly' means in accordance with a sound system and that may mean more than carrying the goods carefully.'[99] Lord Pearce further explained that a sound system does not mean one that is perfect, but one that is 'sound…under all the circumstances in relation to the general

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[96] It is common for voyage charterparties to contain such a contractual clause. See, for example, Gencon 1994, cl 5(a).

[97] [1954] 2 QB 402, 418.

[98] *GH Renton & Co Ltd v Palmyra Trading Corp of Panama (The Caspiana)* [1957] AC 149 (HL), 166.

[99] 1966 SC (HL), 19, 22.

practice of carriage of goods by sea.'[100] In the Court of Appeal in *Volcafe*, Flaux J said that the indicia of a sound system is one 'in accordance with general industry practice.'[101]

The Rotterdam Rules contain a similarly worded provision:

> Article 13 Specific obligations[102]
>
> (1) The carrier shall during the period of its responsibility as defined in article 12,[103] and subject to article 26, properly and carefully receive, load, handle, stow, carry, keep, care for, unload and deliver the goods.

The *travaux préparatoires* to the Rotterdam Rules explain that this wording was adopted because:[104]

> … a widely shared view was that such wording, which originated in the Hague Rules and had enjoyed the benefit of extensive interpretation through case law worldwide, should be preserved in the draft instrument and possibly extended (together with the remainder of the provisions contained in draft article 5, with the exception of draft article 5.4) to the non-maritime segments of door-to door transportation.

The Rotterdam Rules also expressly provide that the shipper or the consignee can assume responsibility for loading, handling, stowing and discharging the goods, provided that such an agreement is referred to in the contract.[105]

The Hamburg Rules, which are said to be a 'cargo-friendly version of the Hague and Hague-Visby Rules',[106] focus the basis of liability on the carrier. Once the claimant proves loss or

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[100] Ibid, 27.

[101] *Volcafe* (n 89) 948. The Supreme Court decision did not address this aspect of the Court of Appeal judgment other than to say the Court of Appeal was wrong to overturn the trial judge's findings on industry practice: see *Volcafe* (n 75) [41]-[42].

[102] Sturley (n 31) [5-016].

[103] Art 12 defines the period of the carrier's responsibility.

[104] UNCITRAL Consolidated Official Reports On the Preparation of the United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea (The Rotterdam Rules) <https://uncitral.un.org/sites/default/files/media-documents/uncitral/en/compilation_of_reports.pdf> (accessed 18 March 2026).

[105] Art 13(2). This essentially provides for 'FIOST' (free in out stowed and trimmed) clauses: see Sturley (n 31) [5-034].

[106] Baughen (n 84) 144.

damage occurred while under the charge of the carrier (set out in Art 4), the carrier is presumed liable by Art 5(1) which, as noted above,[107] provides the basis of liability.

All three regimes, therefore, require the carrier to prove that either it adopted appropriate systems to look after the goods (as required by the Hague Rules and Rotterdam Rules) or, to demonstrate that the systems used would be considered measures reasonably required to avoid loss or damage (as required by the Hamburg Rules).

4.2 Cargo operations and MASS

There is nothing to prevent these rules from applying to MASS operations, but there may be practical considerations relating to how the carrier can comply. If the vessel has no crew, then the loading and discharging operations will likely be carried out by third party stevedores on behalf of the carrier or by remotely operated cranes. This duty to properly and carefully load and handle may be delegated by the carrier to third parties, but liability will remain with the carrier itself unless contractually agreed with the shipper and or consignee.

Once at sea, assuming there is no crew on board to monitor the cargo, the duty to care for the goods will rest with the ROC operators who are monitoring the voyage. This monitoring will require the use of sensors and possibly robots that will send data back to the ROC. Analysis of the data will be conducted with statistical and artificial intelligence tools.[108] In the event of a risk to the cargo, the duty will rest on the master in the ROC to engage salvage services, which will bind cargo interests.

Article 6(2) of the Salvage Convention 1989 authorises the shipowner to bind the cargo owner to a salvage contract if the property is in danger:[109]

> The master shall have the authority to conclude contracts for salvage operations on behalf of the owner of the vessel. The master or the owner of the vessel shall have the authority to conclude such contracts on behalf of the owner of the property on board the vessel.

[107] Text to n 25.
[108] Wright (n 3) 89.
[109] See Francis D Rose, *Kennedy & Rose: Law of Salvage* (10th edn, Sweet & Maxwell 2021) [10-062].

Soyer et al have raised the question of whether the ROC itself is liable for failure to care for cargo:[110]

> The position of the control station, which is not party to the contract of carriage, is less clear as a matter of law. Very possibly, however, it owes a general duty of care to the owner of cargo on board a vessel under its control. If so, any negligence on its part, such as failing to take care to ventilate cargo, avoid a collision or cause the vessel to sail round an area of heavy weather will make it liable to cargo interests for any damage suffered as a result. Ironically, this may mean that the centre will be liable to cargo in cases where the ship operator itself would not be, as with navigational fault.

This question similarly applies to whether the ROC can bind cargo owners to a salvage contract. On a strict reading of the language of Art 6(2) of the Salvage Convention 1989, this would be answered in the negative. However, the ROC operator could be considered as the functional equivalent of the master and thus would have the authority to bind the cargo owner to the salvage contract if the property is in danger. As Tsimplis highlights, if the property is not in fact in danger, such as when the sensors indicate a problem with the ship when in fact it is the sensor that is faulty, then it can be expected that disputes will arise between the carrier and cargo.[111]

It is possible that these advanced monitoring systems could become part of the industry standard for properly and carefully caring for goods on conventional ships if they are proven to be more effective. The Marine Accident Investigation Bureau (MAIB) in the UK has reported that recent serious collisions:[112]

> [I]ndicate a need to radically rethink the role of human watchkeepers in the digital age. Humans do not make good monitors and if under-stimulated they will find other things to occupy themselves. But, as the DMAIB4/MAIB application and usability of ECDIS

[110] Barış Soyer, Andrew Tettenborn and George Leloudas 'Remote Controlled and Autonomous Shipping: UK Based Case Study, University of Swansea <https://www.swansea.ac.uk/media/Remote-Control-and-Autonomous-Shipping-Final.pdf> [27] (accessed 19 March 2026).

[111] Above (n 83) 289.

[112] Marine Accident Investigation Branch, Annual Report 2024. <https://assets.publishing.service.gov.uk/media/687903be760bf6cedaf5be62/2025-MAIBAnnualReport2024.pdf>, 2 accessed 20 March 2026.

> safety study indicated, humans can also be reluctant to utilise system functions that will alert them to impending problems.

When monitoring cargo, advanced sensors that send alerts to the ROC when the cargo is at risk could also be used on conventional vessels, instead of alerting the bridge, and may be considered part of a 'sound system'.

5 The carrier's defences

The Hague (and Hague-Visby) Rules, Hamburg Rules, and Rotterdam Rules all contain provisions on liability and defences available to the carrier. The availability, or not, of such defences (exceptions)[113] is likely to be affected by autonomous operations. Of particular relevance to the operation of uncrewed ships are the exceptions for negligent navigation, fire, and latent defects.

5.2 Negligent navigation

Article IV, rule 2, of the Hague (and Hague-Visby) Rules contains the list of exceptions for which the carrier is not liable. The first is the notorious nautical fault exception.

> Neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from
>
> (a) Act, neglect, or default of the master; mariner; pilot or the servants of the carrier in the navigation or in the management of the ship

The nautical fault exception was originally justified on the grounds that the carrier does not have control over the actions of the master and crew while at sea. In *The Lady Gwendolyn*, Sellers LJ[114] stated that:

[113] Or 'exonerations': see Sturley (n 31) [5-047].

[114] *Arthur Guinness, Son & Co (Dublin) Ltd v The Freshfield (Owners) (The Lady Gwendolyn)* [1965] P 294 (CA), 330.

> Navigation of a ship at sea is so much in the hands of the master, officers and crew and so much out of the control of the owners that the failure of an owner to establish no actual fault or privity in respect of navigation itself is exceptional and striking.

It is also justified on a commercial basis as a compromise between shipowner interests and cargo interests. In the *travaux préparatoires* to the Hague Rules, Sir Norman Hill explained:[115]

> This clause, Article 4, is the shipowners' clause. Now, Sir, I would venture to remind the Committee that we have dealt with the cargo interests clause in Article 3, and we have agreed and accepted the actual words that the cargo interests have put forward imposing the obligations on the ship with regard to seaworthiness, and, what is more important, we have accepted Article 3 (2), which says that 'The carrier shall be bound to provide for the proper and careful handling, loading, stowage, carriage, custody, care, and unloading of the goods carried'. We have not sought to weaken those or qualify those in any way. When we come to Article 4 (2) our big point is the navigation point, and what we have asked is that we should have the words which from time immemorial have certainly appeared in all British bills of lading.

If there is no onshore person navigating, but the software or AI system is 'in charge' of navigation and is negligent, it is unlikely that this would be considered the 'act' of a master, mariner or pilot. Nor can software or AI be considered a servant unless it is given legal personality.[116] This is a failure of a system and may point to unseaworthiness, or, alternatively, it may be classed as a latent defect.

However, Sir Nigel Teare has suggested in the context of MASS and passage planning that an error of the system could be classed as negligent navigation as if it were negligence by a human on watch:[117]

> If such error is the result of a defect in the software, the automated vessel would presumably be regarded as unseaworthy. Yet again, there would be no breach of due

[115] Francesco Berlingieri (ed), *The Travaux Préparatoires of The International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading of 25 August 1924 The Hague Rules and of The Protocols of 23 February 1968 and 21 December 1979 The Hague-Visby Rules* (Comité Maritime International 1997) 391.

[116] This may be considered in the future, see Law Commission (England and Wales), AI and the Law: Discussion Paper, 31 July 2025, 21.

[117] Sir Nigel Teare, 'Seaworthiness, Negligent Navigation and Safer Ships' [2023] LMCLQ 566, 577.

> diligence by the owner unless the owner could and should have detected the error before the commencement of the voyage. But if the error is the result of an error by the artificial intelligence of the computer, then that might well be regarded as negligent navigation by the computer, just as if it had been an error by the officer of the watch. Thus, one can envisage expert evidence, not as at present from masters and superintendents, but from software engineers as to the defect and as to whether the defect could and should reasonably have been discovered by the owner or whether it was simply a mistake by the artificial intelligence of the computer.

If an error by the software is considered an 'error of navigation', this may permit the owner to rely on Art IV, rule 2(a). This would be controversial, especially as the nautical fault exception has been described as 'an unprincipled anachronism on the verge of extinction,' with 'no good reasons for sustaining, let alone expanding it.'[118] It is also noteworthy that neither the Hamburg Rules nor the Rotterdam Rules[119] has retained this exception.

If an onshore human operator who is navigating and does something negligent by misusing the navigation system, would the carrier be provided the benefit of this defence? As pointed out by Soyer et al , it is possible that the ROC is not a party to the carriage contract and is not the carrier.[120] The ROC can be a third-party provider of services to the ship, in which case it could be held liable in tort to the cargo owner without the benefit of the defences in the Hague Rules. That said, the IMO has stipulated that there must be a human master in charge of a vessel regardless of the mode of operation, and that person can be on shore.[121] This person will be responsible for navigation of the ship and would be considered either the master or possibly 'other servant' of the carrier. In these circumstances, the exception can apply, but only if the negligence is in relation to the navigation or management of the ship. If the negligence relates to the management of the cargo, the carrier is not within the

[118] Paul Myburgh, 'Charting the Limits of the Nautical Fault Exemption: *The Tasman Pioneer*' [2009] LMCLQ 291, 294.

[119] See Sturley (n 31) [5-077].

[120] Above, text to n 110.

[121] IMO, Report of the Joint MSC-LEG-FAL Working Group on Maritime Autonomous Surface Ships (MASS-JWG) 2nd session 'Development of a Goal Based Instrument for Maritime Autonomous Surface Ships (MASS) MSC 107/5/1 2 May 2023, [13.1]-[13.2].

exception.[122] Ultimately, this will be a question of fact, taking into account all the circumstances.

5.3 Fire

All three international regimes contain a provision on fire. The Hague (and Hague-Visby) Rules provide:

> Neither the carrier nor the ship shall be responsible for loss or damage arising or resulting from
>
> (b) Fire unless caused by the actual fault or privity of the carrier[123]

The Rotterdam Rules relieve the carrier of all or part of its liability if 'fire on the ship' caused or contributed to the loss, damage or delay.[124] The Hamburg Rules provide that the carrier is liable for fire only if it is proved to be at fault:[125]

> The carrier is liable
>
> (i) for loss of or damage to the goods or delay in delivery caused by fire, if the claimant proves that the fire arose from fault or neglect on the part of the carrier, his servants or agents;

Although fire is an excepted peril, in the context of uncrewed ships, this does not mean the carrier would not need to have fire extinguishing equipment onboard, and it would be expected that the ship would have automatic systems with at least the same fire-fighting capability as an onboard crew. If it does not, it may be considered a fire resulting from a failure to exercise due diligence to make the vessel seaworthy.

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[122] *Gosse Millard v Canadian Government Merchant Marine Ltd (The Canadian Highlander)* [1928] 1 KB 717, dissenting judgment of Greer LJ upheld in *Gosse Millard v Canadian Government Merchant Marine Ltd (The Canadian Highlander)* (1929) AC 223 (HL).

[123] Art IV, r 2(b).

[124] Art 17(3)(f). See Sturley (n 31) [5-079].

[125] Art 5(4)(a). See Wilson (n 25).

5.4 Latent defects

The carrier will also be relieved from liability if the damage results from latent defects not discoverable by due diligence.[126] The standard is that of a competent person using ordinary care.[127] Under the Hague (and Hague-Visby) Rules, such a defect must not have been discoverable before and at the beginning of the voyage, but the Rotterdam Rules make this condition applicable for the whole voyage. If the defect could have been discoverable by an 'examination as a reasonably careful [person] skilled in that matter',[128] the ship is unseaworthy.

Whether or not latent defects in the ROC itself or in software would be covered by this exception is less clear. In the insurance context, latent defects have been given increasingly expansive definitions, but such definitions are limited to material defects and defective design that lead to material damage.[129] A latent defect in software is not considered a latent defect under the current wording of hull and machinery insurance policies,[130] and is unlikely to be considered a latent defect which may point to unseaworthiness. In the *Muncaster Castle*, Lord Hobson commented:[131]

> It is true that ships have become more and more complicated since the days of sail and complications have no doubt multiplied since the passing of the Act of 1924, but this does not justify a more lenient construction being put upon the Act in favour of shipowners.
>
> The obligation in article III is not subject to any qualification, and it is generally recognised that the Act was not passed for the relief of shipowners but to standardise within certain limits the rights of the holder of every bill of lading against the shipowner.

Furthermore, the existence of a latent defect does not mean that a carrier will be able to rely on Art IV, rule 2(p), if they have not exercised their due diligence under Art III, rule 1. In the

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[126] Art IV r 2(p). See Girvin (n 24) [28.44].
[127] *The Dimitrios N Rallias* (1922) 13 Ll L Rep 363 (CA), 365–366.
[128] *Charles Brown & Co Ltd v Nitrate Producers' Steamship Co Ltd* (1937) 58 Ll L Rep 188, 192.
[129] *Prudent Tankers Ltd SA v The Dominion Insurance Co Ltd (The Caribbean Sea)* [1980] 1 Lloyd's Rep 146 (CA).
[130] Luci Carey, 'Autonomous Ships and Hull and Machinery Insurance' in Girvin and Ulfbeck (n 83) 273.
[131] *The Muncaster Castle* (n 49) 879.

Happy Ranger, there was a latent defect; nevertheless, the carrier was found to have breached its duties under Art III, rule 1, and Art III, rule 2.[132]

If there is a defect in the software or code as part of automated cargo handling system on the ship which does not affect the seaworthiness of the vessel but impacts the cargo, this may permit the carrier to rely on Art IV, rule 2(p) provided the carrier has exercised due diligence to ensure that it has run diagnostic tests and kept the computer software and systems updated and secured in a manner of a reasonably careful person. It has been argued that going beyond this is unreasonable; it would be unreasonable to expect a carrier to verify every line of code in a complex system. If the system uses machine learning, this may not be comprehensible to any human.[133] On this analysis, carriers are more likely to be able to use the Art IV, rule 2(p), defence in relation to their Art III, rule 2 obligation.

If defects in the software or machine learning systems are *not* considered a latent defect, the carrier may try to rely on Art IV, rule 2(q):[134]

> Any other cause arising without the actual fault or privity of the carrier, or without the fault or neglect of the agents or servants of the carrier, but the burden of proof shall be on the person claiming the benefit of this exception to show that neither the actual fault or privity of the carrier nor the fault or neglect of the agents or servants of the carrier contributed to the loss or damage.

For a carrier to rely on this defence, the cause of the loss or damage must not be connected to the carrier or its agents or servants. It has been successfully invoked in relation to damage to cargo caused by seawater after stevedores pilfered a brass plate from a storm valve, as Sellers LJ held that this act was outside the course of their employment and unconnected to the cargo itself.[135] However, while this defence is rarely successful[136] and is not transposed

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[132] *Parsons Corp v CV Scheepvaartonderneming (The Happy Ranger)* [2006] EWHC 122 (Comm), [2006] 1 Lloyd's Rep 649.

[133] Julian Clark and David Owens, 'The Role AI and Machine Learning Will Play in Maritime and Trade Law' in Barış Soyer and Andrew Tettenborn (eds), *Disruptive Technologies, Climate Change and Shipping* (Informa 2022) 91.

[134] Girvin (n 24) [28.47].

[135] *Leesh River Tea Co Ltd v British India Steam Navigation Co Ltd (The Chyebassa)* [1967] 2 QB 250 (CA), 268.

[136] For a relatively recent unsuccessful attempt, see *Allianz Global Corporate & Specialty SE v Bore Ltd* (Cour de Cassation – Chambre Commerciale, 23 Novembre 2022) CMI2056, downloadable from <https://cmlcmidatabase.org/>.

into the Rotterdam Rules, it may be possible for a carrier to rely upon it if a cyber-attack results in the loss or damage of goods that could not have been prevented with the exercise of due diligence to protect the system.

6 Who is within the scope of the rules?

Article I(a) of the Hague (and Hague-Visby) Rules provides that '[C]arrier includes the owner or the charterer who enters into a contract of carriage with a shipper'. The problem with this is that it does not include agents and servants who are not then provided the benefit of the exceptions and limits in the Hague Rules. The Hague-Visby protocol amended this omission by Article IV*bis*, which provides that:[137]

> If such an action is brought against a servant or agent or carrier (such servant or agent not being an independent contractor), such servant or agent shall be entitled to avail himself of the defences and limits of liability which the carrier is entitled to invoke under these Rules.

The crucial words here are 'not being an independent contractor', which means that stevedores are not entitled to the limitations and defences available to the carrier and its agents. Similarly, this is a risk for the ROC. If the ROC is not an agent or servant of the carrier, they are not protected by the limits of liability in the Hague Rules, nor the time bar, and may not invoke one of the Art IV, rule 2, defences. If the contract with the ROC contains an indemnity clause for any liability incurred in providing services to the uncrewed vessel, the carrier may find themselves similarly exposed.

Article 1 of the Hamburg Rules provides:[138]

> 1. 'Carrier' means any person by whom or in whose name a contract of carriage of goods by sea has been concluded with a shipper.

[137] See Carver (n 18) [9-311].
[138] Ibid [10-002].

> 2. 'Actual carrier' means any person to whom the performance of the carriage of the goods, or of part of the carriage, has been entrusted by the carrier, and includes any other person to whom such performance has been entrusted.

Article 10[139] places liability on the carrier for the acts and omissions of the actual carrier where the performance of the carriage contract is entrusted to an actual carrier. This may be problematic where ROC services are used, as they may not be considered to perform the carriage of goods but rather to monitor navigation or cargo. The goods are not within the ROC's possession; the goods are on a ship over which they have some, but not all, control. That ultimately remains with the carrier.

Article 4 of the Rotterdam Rules[140] sets out the applicability of defences and limits of liability:

> 1. Any provision of this Convention that may provide a defence for, or limit the liability of, the carrier applies in any judicial or arbitral proceeding, whether founded in contract, in tort, or otherwise, that is instituted in respect of loss of, damage to, or delay in delivery of goods covered by a contract of carriage or for the breach of any other obligation under this Convention against:
>
> (a) The carrier or a maritime performing party;
>
> (b) The master, crew or any other person that performs services on board the ship; or
>
> (c) Employees of the carrier or a maritime performing party.

Article 1[141] defines a maritime performing party as:

> [A] performing party to the extent that it performs or undertakes to perform any of the carrier's obligations during the period between the arrival of the goods at the port of loading of a ship and their departure from the port of discharge of a ship. An inland carrier is a maritime performing party only if it performs or undertakes to perform its services exclusively within a port area.

[139] Ibid [10-015].
[140] See Sturley (n 31) [5-193].
[141] Ibid, [5-140].

If the carrier contracts a ROC to undertake the navigation of the voyage and associated monitoring duties of the cargo under the contract of carriage, the ROC can be considered a maritime performing party and within the scope of the liabilities and defences contained in the Rotterdam Rules. However, the provider of an AI navigational system would not be considered a maritime performing party as this would be a service to the ship, not the cargo.

7 Conclusion

The international sea carriage conventions were not drafted with uncrewed operations in mind. Given the current lack of appetite for new conventions or treaties, it is likely that autonomous vessels will be shoehorned into the existing ones. Rather than trying to amend the conventions, it would be preferable to insert clauses in bills of lading for autonomous cargo services, provided they do not derogate from the applicable convention. This would be a straightforward solution.

The Rotterdam Rules are unlikely ever to replace the existing regimes. The Hamburg Rules are more straightforward to apply to MASS operations in the sense that there is presumed fault rather than specific duties or obligations; the burden of proof is on the carrier to show that it took all measures that could reasonably be required. The Hamburg Rules also extend to servants and agents. If the ROC is not operated by the ship owner but is outsourced to a third-party provider of navigational and operational services, then the remote operation centre would be considered the servant or agent of the carrier, thus bringing itself within the scope of the Rules. It is preferable to place the burden of proof on the carrier, as it will have data and records of the voyage, cargo-monitoring data from sensors, and so forth. This means that the carrier has easy access to evidence relevant to any claim. However, the Hamburg Rules have not been widely adopted, and the Hague and Hague-Visby Rules remain dominant.

The Hague and Hague-Visby Rules do not create insurmountable hurdles for the carriage of goods on uncrewed ships. The duties placed on the carrier regarding seaworthiness and cargo care can be met by a carrier using autonomous systems and remote operations. Questions remain as to whether the nautical fault exception can be relied upon and whether latent defects in software constitute a defence. In the absence of any review of the Hague and Hague-Visby Rules, which is unlikely, and if this is a barrier to cargo interests contracting with

carriers providing uncrewed ships, parties can draft clauses for use in bills of lading which can require the carrier to contract out of those defences. It is recognised that this is a piecemeal solution in the short term, but it would seem to be the most commercially practical approach.