



THE CONFLICT BETWEEN MARITIME LAW & UNMANNED SHIPPING: MANNING THE UNMANNED GHOST SHIPS?

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ABSTRACT

Keywords: Autonomous Vessels, Manning, Onshore Control Centres, Unmanned Shipping

The modern technology of ‘unmanned shipping’ is gradually becoming the future of maritime transport due to increased navigation safety. Though the master and the crew have been traditionally considered to be vital to the safe operation of the vessel at sea, numerous concerns have been raised with regard to safe navigation of the unmanned vessel at sea which are controlled and operated largely by instantaneous communication, from remotely operated vessels to fully autonomous vessels. This gives rise to serious challenges from a regulatory perspective with respect to the line of control over the vessel and the conservative legal framework governing navigation of vessels at sea.

There exists no uniform definition for the term “ship” and “vessel” under International Maritime Conventions and though unmanned vessels may still largely fall under the scope of these maritime definitions, it is dubious to interpret unmanned vessels under the existing Conventions. Many of the International Maritime Conventions contain regulations relating to manning and crew training but these are irrelevant to unmanned vessels.

Hence, there’s a dire need to amend current regulations of Maritime Conventions and adopt new regulations with respect to training and qualification of personnel at onshore control centres, including operating technology and communication.

INTRODUCTION

In the background of unmanned shipping, the words ‘autonomous’ and ‘unmanned’ are used interchangeably. The “crew” becomes pertinent in the operation of any vessel, be it manned or unmanned but legal issues tend to arise about the “crew” in the operation of an unmanned autonomous vessel. Most Maritime Conventions use the word “seafarer” to refer to the “*crew of a ship*”. The term “seafarer” came into relative use only recently but most Conventions use the term “seaman”. Nevertheless, the exact definition of ‘Seaman’ is precisely not clear. The 2006 Maritime Labour Convention (MLC) states that “*seafarer means any person who is employed or engaged or works in any capacity on board a ship to which the Convention applies*”¹. This implies that unmanned ships will be controlled by personnel at the shore control centre who will have to be adequately qualified in seamanship and navigation. Under the 2006 definition of the MLC, the crew at the shore control centre will still be engaged in the navigation of the ship but not “on board” the ship. Unmanned ships have additional cargo capacity due to the complete absence of crew and their accommodation facilities. Operation of unmanned vessels create legal ambiguity as they aren’t recognized under any of the

¹Article II, 1 (f) The Maritime Labour Convention, 2006



existing Maritime Conventions and can cause insurmountable difficulties during Port State Control (PSC) inspection in Port States. As a result, the applicability of Maritime Conventions to unmanned vessels and their operational documentation not only creates legal dilemmas but can distort international trade market during cross trading².

Though commercial unmanned shipping doesn't exist yet, it carries the potential danger of shipwrecks due to limited situational awareness. It is impossible to exactly and consistently monitor the weather situation and nautical traffic via camera feeds as the unmanned ships have a reduced sense of natural 'bodily feel'. While operating unmanned ships, workers at the shore control centre would tend to make errors due to plurality of ships when they are frequently loaded with too much information regarding the steering of multiple ships. There could also be communication challenges if the shore control centre has lots of cultural and linguistic variations in a geographical area. The way unmanned vessels would be operated from the shore control centre is still an open question³. But the most beneficial approach is that unmanned vessels would be usually controlled from nearby larger ships or ports to protect them from adversaries. Unmanned vessels which undertake long voyages are monitored via satellite communication from the shore control centre. When all is said and done, operation of unmanned vessels at sea carry a plethora

of legal challenges such as ship registration, line of control of the vessel, recognition of the Port State for unmanned vessel in cross trading, PSC Inspection and regulation of unmanned vessels among others. The important question to be considered is- Should the operation of these unmanned vessels require the creation of an entirely new legal framework or not? Under English Law, is it safe to assume an unmanned vessel a ship?

REGISTRATION OF UNMANNED SHIPS: *Maritime Law Issues of Autonomous Ships?*

• *Can a Craft be registered as a Ship to the Flag State?*

Assuming that the flag state is UK, a basic distinction has to be made between a 'Craft' and a 'Vessel' and their connotations under Maritime Law. Under the *Revised Statutes of the United States*, a 'vessel' has been defined as "including every description of watercraft or other artificial contrivance used, or capable of being used as a means of transportation by water"⁴. In other words, a vessel is any structure made to float upon water for the purpose of commerce or war, whether impelled by wind, steam or oars. It has been held by the courts that during the construction of a craft which unquestionably will be a vessel, at any specific time before its completion is not considered to be a definite vessel.

Classic Admiralty authority argues that a ship or vessel is born only when it is launched. But the essential question still remains: When does a craft become a

²Donald R Rothwell & Tim Stephens, *The International Law of the Sea* (2ndedn, Bloomsbury, 2016), 49, 50

³*Ibid*, p. 54

⁴Revised Statutes of the United States, 1873



vessel? In *Muntz v. A Raft of Timber*⁵, a raft was held to be a vessel which was carrying a pilot, crew and a cook who lived and were sheltered during a long voyage. Similarly, a hopper which was not fitted with oars or other means of propulsion, and generally moved by towing was held to be a ship in the *Star Buck* case⁶. Any craft engaging in, and aiding commerce upon navigable waters was sufficient for the craft to be qualified as a vessel⁷.

In the context of the 1982 United Nations Convention on the Law of the Sea [UNCLOS], there are no obstacles in considering an unmanned craft as ships and the rules of the freedom of navigation on the high seas, the Exclusive Economic Zone above the continental shelf as well as the right of innocent passage through the territorial sea will become applicable⁸. Thus, the said craft can be registered as a ship to the flag state UK. An unmanned ship will have to fly the flag of a State in whose Ship Register it's registered. It has been held in the *Asya* case that a ship not sailing under the flag of any State had no right to freedom of navigation.

Naturally, Article 90 of UNCLOS and Article 4 of the 1958 Convention on the High Seas [HSC] deal with the customary right of navigation open to all States⁹. Article 94 (1) of the UNCLOS lays down that the flag state shall exercise effective

jurisdiction and control in administrative, technical and social matters over ships flying its flag. Even Article 5 of the HSC states that the conditions for grant of nationality to ships and the registration of ships in its territory is exclusively that of the flag state. So, the flag state is sovereign to grant nationality to both its ships and foreign ships under its Ship Register thereby automatically making all vessels subject to its jurisdiction and laws¹⁰.

II. *Can an Unmanned Ship be registered?*

In the Law of the Sea, the term “ship” and “vessel” haven't been strictly defined and even the UNCLOS didn't define it and uses both these terms interchangeably. Majority undoubtedly assume that unmanned vessels must be regarded as ships for the purposes of the Law of the Sea. Thus, the rule under the UNCLOS which define the rights and duties of States in international shipping equally apply to the operation of unmanned ships which enjoy established rights in International Conventions such as the right of innocent passage, freedom of high seas, etc. Under English Law, a “ship” is defined as *including every description of vessel used in navigation* but yet the term ‘navigation’ is undefined¹¹. Most commentators agree that there is no indication in the UNCLOS for the mandatory presence of a crew to be categorized as a ship.

⁵*Muntz v. A Raft of Timber* [C. C., E. D. La.1883] 15 F. 555

⁶The *Star Buck* case [61 F. 502 D. C., E. D. Penn., 1894]

⁷Donald R Rothwell, (n 2), 60, 61

⁸United Nations Convention on the Law of the Sea, 1982

⁹The Convention on the High Seas, 1958

¹⁰Burmeister H C & Bruhn W C., RØDSETH Ø.J. and PORATHE T., “Can unmanned ships improve navigational safety”? Paris, Paris Transport Research Arena [2014], 10

¹¹Cartner J, A C Fiske & R P Leiter, “The International Law of the Shipmaster”, London, Informa [2009], 786



The UK Merchant Shipping Act, 1995 defines ‘vessel’ as “*any ship or boat, or any other description of vessel used in navigation*”. According to the Hague Rules, a ‘ship’ means “*any vessel used for the carriage of goods by sea*”. The UN Convention on Conditions for the Registration of Ships defines ‘ship’ as “*any self-propelled sea-going vessel used in international seaborne trade for the transport of goods, passengers, or both within the exception of vessels of less than 500 gross registered tons*”¹². Having a crew on board, including a master isn’t generally regarded as an essential part of the notion of a ship under the regulatory definition of ships available to us and hence unmanned vessel can execute duties as traditional manned vessels. There is no bar in registering an unmanned vessel as a ship.

Though unmanned vessels can be qualified as a ship and enjoy navigational rights under the UNCLOS, Article 94 of the UNCLOS poses some serious problems to unmanned ships where the duties of the flag state were designed and adopted for conventional ships with a crew¹³. Unmanned ships can become illegal due to the absence of a crew with appropriate qualifications and hence the provision for the master and the crew being in charge of an unmanned ship becomes obsolete. Moreover, the term ‘*Master*’ is not defined under the UNCLOS although several domestic laws define the term as the individual having ‘command’ or ‘charge’ of the ship.

¹² Article 2, The United Nations Convention on Conditions for the Registration of Ships, 1986

¹³ UNCLOS (n 8)

The biggest conundrum to unmanned vessels is Regulation 14 of the International Convention for the Safety of Life at Sea (SOLAS) which states that contracting governments should undertake that ‘*each of its ship shall be both sufficiently and efficiently manned*’ which are to be established by a transparent documentary procedure¹⁴. This regulation might prove to be redundant in case of unmanned vessels. Unmanned vessels also directly conflict with the International Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW) by overlooking the necessity of a qualified crew¹⁵. Proving damage due to ship pollution under the International Convention for the Prevention of Pollution from Ships (MARPOL) is again difficult with unmanned vessels¹⁶.

III. *Can an Unmanned Ship have a Genuine Link?*

Article 5 of the HSC and Article 91 of the UNCLOS provide that there must exist a “genuine link” between a ship and the State conferring nationality on the ship, known as the flag state. But the question of “genuine link” is shrouded in ambiguity as neither Convention defines or states the meaning of genuine link nor does it stipulate any

¹⁴Part V/Regulation 14, The International Convention for the Safety of Life at Sea, 1974

¹⁵ The International Convention on Standards of Training, Certification & Watchkeeping for Seafarers, 1978

¹⁶The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78; MARPOL)



consequences if genuine link doesn't exist¹⁷. Due to the absence of a concrete definition of genuine link, enforcement of the genuine link between the ship and the flag state has become a difficult matter. Individual States decide the requirements for satisfaction of a genuine link at their discretion.

Generally, the key elements to constitute a genuine link between a ship and the flag state are the ownership of the vessel, the nationality of the crew and the management of the ship. The formal registration of a ship is normally sufficient to establish genuine link with a State. But it is difficult to establish genuine link with unmanned vessels due to the absence of crew on board as Article 9 of the *UN Registration Convention* speaks about 'manning of ship'¹⁸. Though it can be argued that genuine link can be established solely on the ownership and management of the ship, can persons working at the shore control centre who monitor and operate unmanned vessels be called traditional crew of the unmanned vessel? If yes, is there a legal framework governing it?

The UNCLOS installed genuine link to avoid ship owners from registering their vessels in any State of their choice like the flag of convenience States. But genuine link is not comprehensive even in the case of manned shipping but ownership of the vessel and the crew's nationality formed an important part in determining the genuine link between the ship and the State. The registration of an unmanned ship in a flag

state is an implication that the property law status of the ship will be governed by the law of that State¹⁹. It is highly confusing to establish a genuine link in unmanned vessels due to the absence of a proper qualified crew²⁰.

Even International Conventions like SOLAS and STCW have provisions for manning and crew training for masters and seafarers respectively which makes it difficult for unmanned vessels to fit in the ambit of existing maritime regulatory regimes. As long as unmanned ship is operated or controlled from the shore, whether the shore-based vessel operator can be regarded as the master, or more broadly, the commander of the ship and whether their colleagues are seafarers or crew members? Article 91 of the UNCLOS only talks about genuine link between the ship and the flag state but it is silent on the genuine link between an unmanned vessel and shore-based vessel operator. Can this interrelation be equated to the genuine link existing in a manned ship and a flag state? Majority suggest to modernize the UNCLOS to include unmanned shipping²¹.

¹⁷Gauci GM, 'Is it a vessel, a ship or a boat, is it just a craft, or is it merely a contrivance?' (2016) *J Mar Law Com* 47:479–531 [Google Scholar](#)

¹⁸United Nations Registration Convention, 1974

¹⁹M L McConnell, "'Darkening Confusion Mounted upon Darkening Confusion': *The Search for the Elusive Genuine Link*", [1985] 16 *Journal of Maritime Law and Commerce*, 365-96

²⁰Lielbarde S, 'Concept of seafarer before and after the Maritime Labour Convention 2016: *Comparative Analysis of the legal effects of defining legal concepts in the shape of legal terminology*', RGSL RESEARCH PAPER, {2017}, Available at: http://www.rgsl.edu.lv/wp-content/uploads/2017/03/Lielbarde_final.pdf [Accessed 27 Dec 2018]

²¹M S McDougal, W T Burke & I A Vlasic, "The Maintenance of Public Order at Sea and the Nationality of Ships", [1960] 54 *American Journal of International Law* 25-116



Analysis: In light of the above statements, it is pertinent to note that there are no obstacles under the UNCLOS in considering an unmanned craft as ship and in registering an unmanned vessel as a ship under the Law of the Sea. But unmanned vessels can bring in certain legal challenges when contested against the backdrop of HSC, MARPOL, MLC, SOLAS, STCW and the UNCLOS. Though unmanned shipping will be subject to the same Conventions as traditional ships, the traditional crew on board a ship and the shore-based personnel operating a remote-controlled vessel will have an impact on the marine legal setting. SOLAS, STCW and the MLC require some adaptations to expand the powers and duties of personnel at the shore control centre. The legal challenges of unmanned shipping can be handled by modernizing the provisions of UNCLOS to include unmanned shipping in its ambit through a negotiated multilateral agreement.

TERRITORIAL SEA & UNMANNED SHIPPING: *Fishing in Troubled Waters?*

- I. *Whether an unmanned ship can pass through the territorial sea of another State for delivery of goods in a third State?*

Under the Law of the Sea, the “*territorial sea*” is a marine space up to a limit not exceeding twelve nautical miles measured from the baselines of the coastal State under its territorial sovereignty which includes the seabed and its subsoil, the adjacent waters and its airspace²². It was held in the *Norwegian Fisheries* case that the possession of territorial waters is

compulsory which isn’t optional and not dependent on the will of the State and is characterised by completeness and exclusiveness²³. Although the territorial sea is under the territorial sovereignty of the coastal State, the same coastal State’s sovereignty over the territorial sea can be restricted by the ‘Right of Innocent Passage’ for foreign vessels necessary to accomplish free trade under the freedom of navigation.

But it is important to note that such a right of innocent passage exists only for manned vessels and is ambiguous whether the same equally exists for unmanned vessels also. Given the majority view that unmanned vessels are recognized like any other traditional vessel under the Law of the Sea, then the right of innocent passage definitely exists for them too. It is agreed under the Law of the Sea that foreign vessels exercising the right of innocent passage through the territorial sea shall comply with all such laws and regulations and generally accepted international regulations in accordance with Article 21 (4) of the UNCLOS²⁴.

The unmanned vessel can pass through the territorial sea of another State for delivery of goods in a third State by exercising the Right of Innocent Passage. The right of innocent passage is recognized under the UNCLOS to enable freedom of trade. Even if a particular State has expressed hostility towards unmanned shipping at the IMO, the right of innocent passage would allow the unmanned vessel to pass through the territorial waters of a particular State for the

²²Yoshifumi Tanaka, *The International Law of the Sea* (2nd edn, CUP, 2015), 85, 86

²³ *Norwegian Fisheries Case, United Kingdom v. Norway* [1951] I.C.J. 8 (Jan. 10)

²⁴Tanaka, (n 22), 87



purpose of carrying on trade as the passage is not non-innocent and not prejudicial. If a State objects to the innocent passage of the unmanned vessel in its territorial sea, then Article 2 (3) of the UNCLOS comes into play as the sovereignty over the territorial sea is again subject to the UNCLOS and to other rules of International Law²⁵.

A State can object to the passage of the unmanned vessel only on grounds as specified under Article 19 (2) of the UNCLOS. Moreover, the objection against a vessel by a particular State which is on a trade purpose because of it being unmanned does not carry weight. If the manner of the passage of the unmanned vessel is innocent and is consistent with the right of innocent passage where there appears to be no violation of the coastal State's laws, and no other activity which is in anyway detrimental to the coastal State, the unmanned vessel can pass through the territorial sea of a particular State to deliver goods in a third State.

During the passage of foreign vessels in a particular coastal State's territorial waters, the coastal State shouldn't hamper the innocent passage of foreign ships nor discriminate in form or in fact against the ships of any State carrying cargo according to Article 24 (1) of the UNCLOS. Further in pursuance of Article 26 of the UNCLOS, the coastal State also cannot levy any charge upon foreign ships for the passage through their territorial sea²⁶. A problematic scenario

arises when the unmanned vessel enters the territorial waters of a coastal State where due to the absence of a qualified crew on board, there's no possibility of producing on board certificates and passing the PSC inspection of that coastal State.

As a result, the shore control centre operator might face difficulty when monitoring access of the unmanned vessel if the vessel is detained due to lack of sufficient identity and failure to produce required operational documents on board. The normative basis for the right of innocent passage is the interdependence of States as no single State can claim to be so self-sufficient in all aspects. Ships of foreign vessels can exercise the right of innocent passage for trade and commerce in the territorial sea as long as such navigation is non-provocative²⁷. The right of innocent passage preserves the navigational freedoms of the maritime State by simultaneously protecting the naval security interests of the coastal States. Thus, innocent passage becomes a limitation on the sovereignty of a coastal State for international intercourse.

II. *Whether an unmanned ship attracts legal compliances if it passes through the territorial sea of another State to deliver goods in a third State?*

Assuming that the unmanned vessel is travelling through the territorial sea of a particular coastal State to its destination port in a third State to deliver goods, there's no big difference with respect to the passage of

²⁵Tanaka, (n 22), 88

²⁶Carey L, 'All hands-off deck? The legal barriers to autonomous ships', [ebook] Singapore: National University of Singapore, {2017} p.8, Available at: <http://law.nus.edu.sg/cml/pdfs/wps/CML-WPS-1706.pdf> [Accessed 24 Dec 2018]

²⁷Pritchett PW, 'Ghost ships: Why the law should embrace unmanned vessel technology', {2015} Tul. Mar. LJ, 40, p.197 [Google Scholar](#)



the unmanned vessel through the territorial waters of a particular coastal State but the ship may be required to comply with all such and regulations and other generally accepted international regulations relating to the prevention of collisions at sea in accordance with Article 21 (4) of the UNCLOS²⁸. If the destination port is the same coastal State itself, the right of innocent passage and the duties of the coastal State make allow the unmanned vessel to deliver its goods in the port of the coastal State.

But the right of innocent passage cannot be exercised by foreign vessels in all parts of the sea. Sometimes, the coastal State may mandate foreign ships to use sea lanes and observe traffic separation scheme in force but the schemes must take into consideration of the recommendations of the International Maritime Organization (IMO) such as density of traffic, special characteristics of ships, etc. Ordinarily, regulatory mechanisms do not apply to the design, construction, manning and equipment of ships, except in accordance with international standards. Though Article 25 of the UNCLOS suggests that violation of a ship by the rules and regulations of the coastal State renders its passage non-innocent, no preventive measure or guiding rule exists to prevent such non-innocent passages²⁹.

In spite of the fact that Article 19 (2) (1) and Article 21 giving the coastal State a wide latitude to characterize non-innocent passages, the legislative and enforcement powers of the coastal State are not large. Article 25 (3) of the UNCLOS allows the

coastal State to suspend innocent passage in certain specified areas of the territorial sea but the same provision doesn't mandate the coastal State to suspend innocent passage in the entirety of its territorial sea. The maximum duration of such suspension is an open question³⁰. In such cases, it could temporarily suspend the right of innocent passage in its territorial sea owing to its hostility towards unmanned shipping.

But such a kind of suspension would not only hinder the trade prospects of a coastal State but also hinder its future cross trading in the international market. The broader question is whether unmanned ships and their operators comply with the existing IMO regulations? In case they don't comply, does the coastal State have a duty to detain the unmanned vessel during the passage on its territorial sea? Irrespective of the fact that whether a particular coastal State harbours hostility towards unmanned shipping, the right of innocent passage on territorial seas still looks as an alien concept to unmanned vessels due to the absence of a common consensus internationally on the definition of a "ship" by pushing unmanned vessels into unnecessary legal entanglements³¹. Moreover, unmanned vessels registered under the flag of convenience creates further complications.

For instance, an unmanned vessel whose registration is in an open register of India and should deliver goods to a port in a third

²⁸UNCLOS, (n 8)

²⁹*Ibid*

³⁰Freestone D, Barnes R & Ong D, "The Law of The Sea: *Progress and Prospects*", New York, Oxford University Press [2006], 465

³¹Gavouneli M, "From Uniformity to Fragmentation- *The ability of the UN Convention on the Law of the Sea to accommodate new uses and challenges*"; Leiden, Koninklijke Brill [2006], 358



State by passing through its territorial waters will create three problems. First, whether the flag State has recognized and allowed the unmanned vessel on its ship register to be registered as a ship. Second, the liability of the unmanned vessel and the flag State in case of violation of a particular coastal State's laws during innocent passage. Third, the legal consequences for breach of an unmanned vessel under the existing Maritime Law Conventions. Assuming the nationality of the ship owner is British and the unmanned vessel enters territorial waters of India, by innocent passage and in case of violation, the flag State India bears responsibility but the ship owner will also be liable.

In the absence of specific legal safeguards governing the operation of unmanned vessel, coastal States might claim reparations for breaches of unmanned ships. In such a scenario, innocent passage becomes helpless. Unmanned ships also have the fear of losing communications and don't enjoy any navigational priority over manned ships. So, in order to ensure the safe operation of the unmanned vessel through the shore control operators, introduction of new standards of shipping practice with new amendments to the existing legal procedures becomes mandatory³². In order to protect the sovereignty of territorial seas by the respective coastal States, there should be amendments for the technology and operation of unmanned ships with the shore control centre operators conferred with expanding powers.

³²Ntovas A, 'Autonomous Ships: What does the future hold? Legal considerations', 25/9/2015, by Nautical Institute, Bristol, UK [Google Scholar](#)

Analysis: It is clear that the unmanned vessel can pass through the territorial waters of a particular coastal State to deliver goods in another third State. But the unmanned vessel will be subject to the compliance of laws and regulations and other generally accepted international regulations of the coastal State under Article 21 (4) of the UNCLOS. If a particular coastal State has hostility towards unmanned shipping, the best it can do is to inspect the unmanned vessel with regard to its compliance to IMO regulations such as the operational documents, shore control centre operators, etc. Since the purpose of the unmanned vessel passing through a coastal State's territorial waters is trade, such an innocent and non-provocative navigation of the unmanned vessel cannot be halted by the coastal State except in case of breach of its laws. There's also no big difference if the same delivery has to be made by the unmanned vessel in the port of the coastal State itself as innocent passage applies equally.

CONCLUSION & SUGGESTIONS

The introduction of unmanned shipping in the shipping industry has some comparative advantages over manned ships but the legal status of unmanned vessels isn't very clear. It is due to the fact that there has been no international consensus on the definition of a "ship" in the international community and among specialized agencies like the IMO. So, no concrete classification is possible for unmanned vessels with respect to their legal status, recognition, liabilities and duties. Despite rapid strides in technology on unmanned vessels, the legal framework governing them still looks archaic. Most of the important existing Maritime



Conventions such as the SOLAS, STCW, UNCLOS, etc. don't even have provisions for unmanned vessels making their legality a big question of ambiguity.

Moreover, some important terms such as the 'master', 'navigation', 'crew', etc. needs to be incorporated into the Maritime Conventions to settle ambiguity on unmanned vessels. There haven't been many authoritative cases on the operation and monitoring of unmanned vessels which is difficult again to establish legal precedents in this regard. Equally, all the persons acting behind the operation of unmanned vessel pose the serious question of liability: liability of the shipowner, liability of the shore control centre operator or any other person such as the master at the shore control centre? This kind of scenario creates a complicated situation owing to no legal recognition of unmanned vessels under the existing Maritime Law Conventions. So, the investment in unmanned vessels is still under consideration.

The existing regulatory regime on Maritime Conventions is problematic giving rise to the following challenges:

_ There is total absence of standards, practices and procedures with regard to unmanned ships.

_ There is insufficient international participation to establish a global forum for dialogue on unmanned shipping.

Apart from all these, the future of unmanned shipping appears to be doubtful not only due to legal loopholes but also the mode and complexity in handling the unmanned vessel from the shore control centre. This requires

tremendous training for the crew to be qualified to tackle unmanned ships from the shore control centre through autonomous communication. Other issues as marine insurance, charter parties, etc. were quite easy on manned ships but unmanned shipping has the problem of security with respect to the cargo on board. Unmanned shipping might also incur huge losses in case of any unforeseen accident or failure of communication from the shore control centre operator putting the shipowner and other stakeholders involved in its operation at stake.

Additionally, no existing Maritime Convention specifies provisions for operating an unmanned vessel from the shore control centre unlike in a traditional ship and with regard to special training for the seafarers. Though some countries like Norway are on the path of deploying an autonomous vessel successfully, the legal challenges that unfolds in the near future can only be addressed by amending certain Maritime Conventions and incorporating wide regulations for the safety and operation of an unmanned vessel.

BIBLIOGRAPHY

Primary Sources: -

- o **Cases:**
 1. *Muntz v. A Raft of Timber* [C. C., E. D. La.1883] 15 F. 555
 2. *The Star Buck* case [61 F. 502 D. C., E. D. Penn., 1894]
 3. *Norwegian Fisheries Case, United Kingdom v. Norway* [1951] I.C.J. 8 (Jan. 10)



○ **Statutes & Statutory Instruments:**

1. Revised Statutes of the United States, 1873
2. The UK Merchant Shipping Act, 1995

○ **International Conventions:**

1. The Convention on the High Seas, 1958 (HSC)
2. The International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78; MARPOL)
3. The International Convention for the Safety of Life at Sea, 1974 (SOLAS)
4. The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW)
5. The Maritime Labour Convention, 2006
6. United Nations Convention on the Law of the Sea, 1982 (UNCLOS)
7. United Nations Registration Convention, 1974

Secondary Sources: -

○ **Books:**

1. **Yoshifumi Tanaka**, *The International Law of the Sea* (2ndedn, CUP, 2015), 85, 86
2. **Donald R Rothwell & Tim Stephens**, *The International Law of the Sea* (2ndedn, Bloomsbury, 2016), 49, 50
3. **R R Churchill & A V Lowe**, *The Law of the Sea*, (3rdedn, MUP, 1999), 62, 63

○ **Online Journals:**

1. **Caccia M, Bibuli M, Bono R, Bruzzone G**; 'Basic navigation, guidance and control of an unmanned surface vehicle',

{2004} *Auton Robot* 25(4):349–365 [CrossRef](#) [Google Scholar](#)

2. **Carey L**, 'All hands-off deck? The legal barriers to autonomous ships', [ebook] Singapore: National University of Singapore, {2017} p.8, Available at: <http://law.nus.edu.sg/cml/pdfs/wps/CML-WPS-1706.pdf> [Accessed 24 Dec 2018]

3. **Chwedczuk M**, 'Analysis of the legal status of unmanned commercial vessels in US Admiralty & Maritime Law', {2016} *J Mar Law Com* 47:123–249 [Google Scholar](#)

4. **Gauci GM**, 'Is it a vessel, a ship or a boat, is it just a craft, or is it merely a contrivance?' (2016) *J Mar Law Com* 47:479–531 [Google Scholar](#)

5. Ilo.org, Convention C166- Repatriation of Seafarers Convention (Revised), 1987 (No. 166), {2017}, Available at: http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C166 [Accessed 25 Dec 2018]

6. Ilo.org, Text and preparatory reports of the Maritime Labour Convention, 2006 {2017}, Available at: <http://www.ilo.org/global/standards/maritime-labour-convention/text/lang--en/index.htm> [Accessed 23 Dec 2018]
