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Autonomous vessels as ships – the definition conundrum

Mayank Suri¹

¹Assistant Professor, Jindal Global Law School,
India E-mail: msuri@jgu.edu.in

Abstract. The development of unmanned and autonomous vessels has accelerated, resulting in the requirement to study the law surrounding shipping. This article studies recent literature and case laws to determine the various interpretations of the word ‘ship’. It, thereafter, seeks to determine which of these will have a bearing on autonomous vessels and whether the foreseeable technological incorporation is a challenge. Primarily, the focus is on showcasing that definitions across jurisdictions vary. The author points out that in the domain of private international law, this will result in disputes regarding applicability of admiralty laws.

1. Introduction

The operations of autonomous vessels are in the offing as proposed by several projects.[1] There is a steady momentum with respect to awareness of autonomous operations in the shipping industry.[2] Some leading technology manufacturers have started to market products that could tomorrow be one of the essential features of a commercial autonomous vessel.[3] Added to this, the commercial side of shipping operations is seeing a parallel jump in maritime intelligence products that offer efficient fleet management.[4] There are supporting views for international solidarity in regulating unmanned ‘ships’.[5] The Maritime Safety Committee of the International Maritime Organisation has initiated a regulatory scoping exercise to this extent. The Maritime Safety Committee has defined ‘Maritime Autonomous Surface Ship’ as “*a ship which, to a varying degree, can operate independent of human interaction*”.[6] This definition does not reveal any characteristics that would constitute or at least assist in determining what is an autonomous ‘ship’. Some relief is sought in construing ‘operate’ as meaning the entire operation of a vessel’s movement and not just of one particular machinery because that would entail covering all modern ships as MASS. One can also reason that “independent of human interaction” is a reference to a lack of crew because if that is not the case then again ambiguity shrouds over the coverage of unmanned vessels.

It has also been pointed out that the development of autonomous ‘ships’ will surpass the development of the regulatory framework surrounding them.[7] Taking, for example, the AUTOSHIP project which has received European Union funding to the tune of 20 million Euros (approx.), one can foresee a multi-country agreement on the movement of autonomous ships aided by appropriate regulatory frameworks.[8] Studies to investigate the economic viability of such a step are being conducted at an increasing pace.[9] Indeed there are conventional shipping routes between European nations that may be exploited to test the operations of autonomous ships depending on countries agreements.[10]



Therefore, it is important to investigate relevance of the existing jurisprudence in international maritime law with respect to adoption of autonomous vessels. It is also crucial to acknowledge that literature surrounding autonomous ‘ships’ has been on the rise and this is reflective of the broader outlook of the shipping industry. The question this paper seeks to answer is whether the current regulatory framework, allows for admission of the autonomous vessel as a ‘ship’ in the private law domain. Ergo, whether the definition of a ‘ship’ in its current form will be accepting of an autonomous vessel. However, as we move further in this analysis it must be understood that this paper is written on the understanding of a clear difference between an unmanned vessel and an autonomous vessel. The former is a reference to a vessel without any onboard crew and can include an autonomous vessel. It will become clear as to why the current discussion does not need to demarcate this difference at each assertion.

2. Why the need for a study of the definition of a *ship*?

The primary premise on which this paper has been written is that there will be intercountry movement of autonomous vessels. As brought to light above, it has become evident that at least European countries will allow their movement.[11] However, it must not be lost that each country has its own definition of what a ‘ship’ is, therefore at least for legal purposes one should see whether one country’s ‘ship’ will be accepted in another. Generally, the law governing what claims can be effected by way of detaining a ‘ship’ is known as the Admiralty law of the country, a specialism within the broader term ‘*maritime law*’.[12] A particular type of claim peculiar to admiralty laws, in rem claim, gives a claimant the right to arrest and auction the ‘ship’ and satisfy its claim against the proceeds if the shipowner fails to provide alternate security in court.[13] Conclusively, a vessel that fails to come within the definition of a ‘ship’ under a country’s admiralty laws, would destroy the right to claim in rem.

Let’s take a look at two definitions from different countries to understand this better.

India: “(1) “vessel” includes any ship, boat, sailing vessel or other description of vessel used or constructed for use in navigation by water, whether it is propelled or not, and includes a barge, lighter or other floating vessel, a hovercraft, an off-shore industry mobile unit, a vessel that has sunk or is stranded or abandoned and the remains of such a vessel[14].”

Korea: “(1) The term “ship” in this Act means the sort of ships that are used or can be used for navigation on or under the water, and their classification shall be as follows:

1. Steam ship: A ship propelled by an engine (including any ship that has an engine attached to outside the hull which may be separated therefrom, and any ship using both engines and sails which mainly uses an engine, and a wing-in-ground craft (a ship that exploits “wing-in-ground” effect to fly just above the water surface);
 2. Sail ship: A ship propelled by sails (including any ship that uses both an engine and sails, with the latter used mainly);
 3. Barge: A non-self-propelled ship that needs to be towed or pushed by another ship.
- (2) The term “small ship” in this Act means any ship falling under any of the following subparagraphs:
1. Steam ships and sail ships of less than 20 gross tonnage;
 2. Barges of less than 100 gross tonnage.[15]”

From reading the above two definitions, it becomes clear that parties in these two jurisdictions would view different things as ‘ships’ from a legal viewpoint. For example, the Indian definition of a ‘vessel’ does not include a wing-in-ground craft (“WIG”), whereas the Korean definition expressly includes it under the definition of a ‘ship’ and classification of a ‘steam ship’. This entails that where a WIG would be subject to the admiralty law of Korea, this may not be the situation in India. A corollary of this analysis would mean that a claimant trying to initiate an *in rem* action against a WIG in India would

have to persuade the court that the particular vessel falls within the broader definition of a vessel as given above while in Korea this would not be a hurdle to the claim. Similarly, a hovercraft may be subject to almost identical treatment in a Korean court of law.

In fact, one can also understand the importance of definitions when studied through the lens of WIG in the collision regulations. When WIGs were introduced, they were a unique kind of craft which existed at the intersection of the maritime and aviation industries.[16] Their characteristic ‘over-the-water’ movement posed a regulatory conundrum. However, acknowledging that the WIG would operate and exist around other waterborne vessels, the IMO adopted it as part of the international maritime regime even with its multimodal nature.[17] Therefore, it lends support to the argument that when a technologically different craft is introduced, it shall benefit the regulatory framework to expressly include it within the definitions.[18]

3. Literature Review

3.1 *The law of unmanned merchant shipping – an exploration*[19]

Dr. Hooydonk in this article has explored the legal status of commercial, surface-operating unmanned cargo and passenger vessels. He states how maritime law has withstood the test of time and technological advancement. He brings to light the stable nature of maritime law by presenting the reader with a range of developments – from times of sail to nuclear propulsion. At one point, Dr. Hooydonk writes about the distinction between Remotely Operated Vehicles (ROVs) and Autonomous Vehicles (AVs). He emphasizes that a clear distinction should be made between an unmanned vessels, waterborne robots and the like. This clarity lies in whether the waterborne robot can be considered part of a mother ship or its equipment. However, thereafter he uses the term ‘unmanned underwater craft’ while stating several civil purposes for which these are employed. But this use is unsupported by any reference to a mother ship (or lack thereof), mystifying, whether these should be considered as unmanned vessels or waterborne robots or both.

It is Section 2 of his article, that is of immense consequence to this discussion.[20] He observes that the maritime convention dealing with flag and port state rights and responsibilities, the UN Convention on the Law of the Sea (“UNCLOS”), does not define the term ‘*ship*’ and uses it interchangeably with ‘*vessel*’. He points out that public law maritime conventions apply their own definitions tailor made to serve the Convention’s purpose. He thereafter states that major private maritime law conventions; such as those on collision, arrest and limitation of liability; do not provide a definition. Few private maritime law conventions define a ‘*ship*’ in broad terms. It is Dr. Hooydonk’s statement, “*National maritime laws give an equally heterogeneous picture*”, which resonates with this discussion. He concludes with a fair amount of certainty that having a crew on board is not an essential requirement for the notion of a ‘*ship*’.

It is imperative to note that where private maritime law conventions are silent and a challenge is made as to the identity of the ‘*ship*’, a court would be left with no choice but to derive it from definitions found in national laws.[21]

3.2 *The integration of unmanned ships into the lex maritima*[22]

The other text which has contributed immensely to the discussion argues that the definition conundrum does not pose a major impediment since the presence of onboard seafarers is not an express prerequisite to ‘*ship*’ status under the international regulatory regime. The authors have identified two crucial issues which need answering; whether unmanned crafts can be operated as safely as conventional ‘*ships*’ and can enforcement of claims be at least as effective. It is this second issue which is of relevance to this article. They correctly note that for the unmanned craft to be operated within the territory of that state, it must fall within the national legal framework of that state. Interestingly, the authors have used the word ‘*craft*’, without its legal connotations, in referring to unmanned vessels. There is a further distinction, that this article identifies, that some crafts perform a ‘*predetermined nautical course without any human interaction whatsoever*’, referring to them as ‘*unmanned autonomous craft*’. However, the

article acknowledges that an unmanned craft may be capable of both, remote as well as autonomous operations.

The authors also concur with Dr. Hooydonk, that UNCLOS has used the terms ‘*ship*’ and ‘vessel’ interchangeably without realizing that under some jurisdictions these terms are viewed differently[23]. In one of its footnotes, the article underscored the gravity with which the definition conundrum must be seen. This footnote describes how a US-China dispute in respect of US Navy’s ‘unmanned underwater vehicle (“UUV”)’ saw the two sides debating whether the UUV was a ‘*ship*’ or an ‘unidentified device’[24].

The authors, in citing Gahlen, touch upon the essential aspects of a ‘*ship*’. These being; floatability, capability of controlled movement on water, capability in the carriage of person or goods beyond its own mass; and sea going capability[25]. It argues that the question of what is a ‘*ship*’ becomes increasingly irrelevant when the unmanned craft ‘*performs functions more closely akin to conventional carriage operations*’. In its conclusion on the international regulatory regime discussion, the article notes that there is no ‘*international definition of a ship*’ and this question may substantially be answered by national laws. The article provides an insight into US and some European jurisdictions, where with the exception of France, it does not find a major concern in reading an unmanned craft as a ‘*ship*’. It does, however, indicate that a dependence on national laws would result in a situation where one’s state law does not identify another states’ unmanned ‘*ship*’.

It is submitted that the article is a good starting point on the discussion regarding national laws for private claims. In this respect, it is submitted that it matters not whether the human is controlling onshore or the computer is running autonomously. For what is of consequence is that the vessel is unmanned and must be so seen when interacting with manned vessels or entities (like ports) and therefore, giving rise to possible claims *in rem*.

4. Case Review

This article now looks at some English law cases on the subject.

4.1 *Steedman v Scofield and Another, 1992 2 LR 163 (QBD)*

This was a case involving a collision between a Kawasaki model jet ski and a speedboat. The Plaintiff, owner of the jet ski, had filed a case for damages against the defendants, owners of the speedboat. The defendants contended that by virtue of the late issuance of the writ by the Plaintiff, the case was time barred. To rely on this time bar, the Defendants had to bring the case within the 2 year time limitation provided by the Maritime Conventions Act 1911. However, the application of the Maritime Conventions Act, 1911 depended on whether the jet ski could be called a ‘vessel’, the definition of which was found in the Merchant Shipping Act, 1984 and is laid out below:

“742. “Vessel” includes any ship or boat, or any other description of vessel used in navigation:

“Ship” includes every description of vessel used in navigation not propelled by oars...”.

The judge while dealing with this issue pointed out some highly technical details. He contemplated whether the jet ski could be a boat and answering in the negative he held that a boat has its own buoyancy which that jet ski lacked, it could not even be boarded when it was stationary. The judge then considered meaning of the words ‘*used in navigation*’ as it became apparent that this was the dominant idea behind holding a watercraft to be a vessel. The judge opined that ‘ordered movement in water’ as against simple movement in water and ‘transportation of persons or property’ were the determining factors. He stated that the purpose behind the jet ski was to enjoy the thrills of waterskiing and so, even if it could be navigated per se, it was not meant for that purpose.

It is submitted that this judgment brings to fore some interesting observations. Firstly, the judge relied heavily on the manufacturer’s advertisement i.e. Kawasaki, to come to his findings about what

the jet ski was. He specifically refers to the advertisements' nomenclature of calling it a 'personal watercraft'. He refers time and again to the thrill-seeking purpose mentioned in the advertisement. In his declaration that the jet ski is not a boat he refers to the lack of buoyancy but this distinction can no longer be maintained since jet skis now are fully buoyant and capable of being mounted by 1-3 persons when stationary. However, till date Kawasaki advertises its jet skis as 'watercrafts'[26].

4.2 *R v Goodwin, 2006 1 LR 432 (CoA)*

Interestingly, the second case in our discussion represents the pace of technological developments and the effect it can have on legal interpretations. In this case, which involved a collision between two jet skis, a Yamaha 'Waverunner' jet ski was the defendant's vessel. This jet ski unlike the jet ski in the *Steedman* case, was buoyant enough to seat 3 people when stationary or moving. This was enough for the Recorder, at first instance, to hold that the Waverunner was a 'ship'. The *Steedman* case had such a bearing upon this judgment that one can read the Recorder's narration of the characteristics of the Waverunner as one contrasting with the characteristics of the *Steedman* jet ski.

On appeal, the Court of Appeal, was asked to answer the issue "was the 'Waverunner' a ship?" One of the novel arguments put forward was that jet skis can be registered as "wet bikes" in the register of British ships and therefore, must be construed as 'ships'. The court of appeal after looking at the purpose of registration of ships and going through the *travaux preparatoires*[27] held that registration of a jet ski does not make it a 'ship' for the purposes of the Merchant Shipping Act, 1995. Per the Court of Appeal, registration of a jet ski was closely linked to reasons of financing for purchase.

The court was now supposed to check if the jet ski fell within Section 313 of the 1995 Act which defined 'ship' as follows:

"“ship” includes every description of vessel used in navigation”.

Like the *Steedman* case, here too the court was required to interpret the words "used in navigation". Acknowledging the diversity in the type of vessels that were in use, the court declined to agree with the *Steedman* case that "carriage of goods or passengers" was of consequence to this term. The court of appeal relied on two cases; one, where a backhoe dredger, and; the other, a jack up rig; both non-good/passenger carrying vessels, with very different purposes and construction were held to be ships. Effectively, this meant that "*used in navigation*" no longer limited the scope of the law from governing vessels which carried out other specific activities on the water. In fact, in *Von Rocks*[28], the backhoe dredger could be said to be an anomalous 'ship' for several reasons; it wasn't self-propelled, it's not normally manned by a crew and it has no rudder or other steering mechanism.

It must be noted that the Court of Appeal, came to the conclusion that the Waverunner was not a ship on the basis that it lacked the other requirement for navigation i.e. ordered movement in water. To reach this conclusion, the court considered the purpose behind the legislation itself and it stated that the purpose was to regulate shipping as a trade or business and not as a pleasure sport.

4.3 *Michael v Musgrove [2012] 2 Lloyd's Rep. 37 (QBD)*

In this case involving a rigid inflatable boat ("RIB"), the question was whether the Athens Convention[29] for passenger liability would apply. The English court had to construe whether the RIB fell within the definition of a 'ship' as mentioned in the Athens Convention. This definition is as follows:

"“ship” means only a seagoing vessel, excluding an air-cushion vehicle”.

As apparent on the face of it, this definition does not provide a description or even parameters for defining what a ‘ship’ is. It indeed lacks any extensional or intensional factors which may lead one to infer what the possible physical characteristics of a ‘ship’ could be[30]. However, thanks to the application of this convention in UK by force of law, the court could take assistance of the English statutes as well as cases; some of which we have covered above.

One must make note of the fact that the court has elaborately stated the physical characteristics of the RIB, including what kind of material was used in building it and what paraphernalia form part of the various onboard equipment; the manufacturer, and; the users of RIBs[31]. While the court studied various precedents, we are concerned with what it said on the physical aspects of a vessel considering *Steedman* and *Goodwin*[32]. The claimant’s lawyer submitted that the RIB was unseaworthy to be classed as a vessel basis the fact that it had no cabin and thus, not safe for use as a vessel. The court correctly denied accepting this argument as consequential to the seaworthiness of the vessel. Further, in construing “*used in navigation*” it relied on the manufacturers’ description of the roles of the RIB, specifically stating that the test of ordered movement on water as opposed to “messaging about in boats” had been satisfied.

5. Case Focus: Guardian Offshore AU Pty Ltd v Saab Seaeye Leopard 1702 Remotely Operated Vehicle Lately On Board The Ship 'Offshore Guardian' [2020] FCA 273

This Australian[33] case is the focal point of this paper for several reasons, these are mentioned here in brief:

- a. This case involved a remotely operated vehicle (“ROV”) which was unmanned[34]
- b. The case involved arresting of the ROV for a claim between two private parties.
- c. The case adjudicated whether admiralty law would apply to the ROV.

To offer context to our discussion, it is essential that we highlight some key technical aspects of the ROV:

- a. It was deployed from a ship, referred to in the judgement as “main vessel”.
- b. It was tethered to a metal frame known as the launch and recovery system (LARS) which in turn was winched to the main vessel.
- c. The ROV is operated by two pilots onboard the main vessel. While one pilot controls the movement of the ROV, the other controls lighting, cameras and other equipment inside the ROV.
- d. In words of the court, “*Its physical appearance lacks the attributes that would usually be associated with a structure described as a ship or vessel as a matter of ordinary parlance.*”.

Interestingly, the judgment does not reveal what the particulars of the claim between the parties was. However, what is clear is that the plaintiff was owner of the main vessel onboard which the defendant ROV was once used and the claim was against the owner of the ROV. *Inter alia*, the court framed the following three issues:

- a. Was the arrest warrant issued for the vessel that has been arrested?
- b. Is FCDS the owner for the purposes of s 19 of the Admiralty Act?
- c. Are the ROVs ships? The reference to ROVs in plural is because the writ named two similar ROVs as first defendant and second defendant. This difference is not an issue in context.

This article is concerned with the third issue i.e. “Are the ROVs ships?”. In order to proceed against the ROVs *in rem*, the Australian admiralty law was to be applied. This application depended on whether the definition of a ‘ship’ as mentioned in the Admiralty Act of Australia would cover the ROVs. This definition is reproduced herein below:

“ship means a vessel of any kind used or constructed for use in navigation by water, however it is propelled or moved, and includes:

(a) a barge, lighter or other floating

vessel; (b) a hovercraft;

(c) an off-shore industry mobile unit; and

(d) a vessel that has sunk or is stranded and the remains of such a vessel;

but does not include:

(e) a seaplane;

(f) an inland waterways vessel; or

(g) a vessel under construction that has not been launched.”[35].

The court started its deliberation on this issue by first looking into the historical reasons for incorporating the definition of a ‘ship’ into the act[36]. It is submitted that these reasons would also hold true for other admiralty jurisdictions around the world which are common law jurisdiction[37]. The court explored two of these aspects; first, ‘ship’ became a convenient means of describing the subject matter of admiralty jurisdiction, and; second, the type of property/*res* against which *in rem* proceedings could operate. It is this second aspect which is of relevance to the discussion. The court further noted that the provision ‘*should be interpreted liberally and without imposing limitations not found in the express words*’[38]. It would not take one long to realise the commonality between the general words of this section and the words used in the English, Indian and Korean sections mentioned above.

From the words of this section, the court came to the conclusion that a ship must have three attributes. These were: it must be a vessel; it must be used (or constructed for use) in navigation by water, and; it must be moved by means of water and not just be an aid to navigation. This last attribute, the court said, was implicit in nature; found in the words “however it is propelled or moved” in order to strike out fixed structures from the ambit of the definition. Connecting this implicit attribute to the need to include all rigs which are mobile so as to afford the protection of admiralty laws.

The court then looked at the inclusion of the hovercraft and exclusion of the seaplane from the definition of ‘ship’. In reading purpose into the definition, the court made it very clear that what mattered was the extent to which admiralty jurisdiction would be applicable to these structures. It stated three principles of admiralty jurisdiction: salvage, liability for collision, and; *in rem* jurisdiction to arrest. The extent or degree to which these will be applicable to the structure would determine whether it should be included. This is seemingly the only justification why a hovercraft, which operates on water rather than in it, was included, but a seaplane, which would majorly be in-flight, was excluded.

The claimants, Guardian Offshore, presented the court with a Canadian judgment in which an ROV was arrested and held to be a ship under the broad definition therein provided[39]. This decision rests on two considerations: the Canadian definition is very broad and therefore, inclusive[40], and; the purpose of Admiralty law *qua* jurisdiction.

The court thereafter makes some conclusions concerning the definition of a ‘ship’. These conclusions may be summarised in the following manner:

- a. Various jurisdictions present a plethora of definitions, none of which are comprehensive in respect to the characteristics of a vessel. However, the definitions do not represent the necessity of carrying cargo or passengers.
- b. Navigation ‘*by*’ water is broader than navigation ‘*in*’ water and would not exclude a submersible which moves through water.
- c. There are judicial authorities which review the purpose, attributes and capabilities of a

vessel to determine whether the vessel lacks the usual attributes of a ‘*ship*’.

- d. The application of admiralty law to vessels that can be readily removed from a jurisdiction seems to be a significant factor in determining the coverage under a particular definition.

In holding that the ROV is not a *ship*, the court stated that “*It is a submersible piece of equipment, a vehicle for undertaking remotely-controlled activities underwater.*”. However, there are several anomalies in the judgment which betray this conclusion. First and foremost, the general words of the statutory definition which the court holds to not cover an ROV seemingly are broader than the English law definitions where the word ‘*in*’ is used. Secondly, the courts’ reliance on ‘usual attributes/characteristics’ seems misplaced since it itself reviews cases which deviate from the *Steedman* requirement for carriage of cargo or passengers. It does not seem justified that, therefore a general connotation which may be ascribed to the words ‘usual attributes’ should have been a factor. The courts’ finding that the ROV cannot sustain its own path without the main vessel if detached from the umbilical, its reliance on LARS, limitations on its propulsion, possible unseaworthiness on high seas, characteristic of being carried as cargo on board the main vessel, small size, looks; are possible insights into what the court considered to be a lack of ‘usual attributes’ of a ‘*ship*’. Additionally, the court reiterated that the ROV lacks the capability to face the ‘risks and dangers’ which give rise to admiralty jurisdiction of the court. Seemingly, the court was referring to the ability of a vessel to leave the territorial waters of a country, on its own.

6. Concluding remarks

The above discussion has made it clear that national laws with varying definitions of a ‘*ship*’ present a treacherous terrain for maritime claimants if they have to prove to a court that an autonomous vessel is a ‘*ship*’. It is arguable that a broad definition such as the one in Canadian law would allow for autonomous vessels to be considered ‘*ships*’[41]. This conclusion shall have two parts, first, the conclusion will summarise findings from the above literature and case review in order to show that technological changes are not a challenge. Thereafter, the second part will deal with reasons of why an express inclusion of autonomous ships in the national laws is required.

6.1 Part 1 - Findings

It is worth noting that the discussion has not led to any conclusive finding that a crew or manning of a vessel is an essential requirement for a ‘*ship*’. Which in itself is self-explanatory, for application of Admiralty laws which govern private disputes, the ‘*ship*’ is considered as security/asset for satisfaction of the claim and the presence of crew is inconsequential. The *Guardian Offshore* case reinforces this lack of dependency on manning, where the discussion on ‘usual characteristics’ of a ‘*ship*’ finds no mention of manning. This is also in tandem with the *Von Rocks* case. The *Guardian Offshore* case states 3 principles of admiralty jurisdiction, all of which, foreseeably, can apply to autonomous ships. As these are not of a technological nature, they do not pose a threshold hurdle for autonomous ships to be governed by the admiralty laws of a country. They can be arrested/auctioned in satisfaction of maritime claims. While this is a positive factor for acceptance of an autonomous ship within the definition of a ‘*ship*’ in the domestic laws of a country, it remains to be seen how international conventions which mandate crewing/manning on board will adopt. Resultingly, where a country’s ship registration rules or compliance rules are based on those international conventions, there would be an impediment to the operation of autonomous ships.

One thing is certain, that courts have relied upon the manufacturer’s descriptions about the disputed vessels and the industry should maintain its reliance on the term ‘*ship*’. The growing pace of developments is a clear signal that the definition conundrum will find its day in court. It is submitted that legislatures around the world and especially, maritime countries, should stay updated with these developments and when possible make an express inclusion of autonomous vessels in their legislations.

Weight for this argument is found in the *Steedman* case and manufacturers/operators may be well advised to keep the word ‘*ship*’ in the autonomous ships in development.

There is one common element which finds itself manifesting in the argument on ‘usual characteristics of a ‘*ship*’ but also, otherwise; buoyancy. However, the projects in development and those envisioned would not seemingly fall obtuse of this requirement[42]. Although, one would fare better if they keep in mind that buoyancy as a factor did impact the court’s analysis of two similar kind of products, jet skis, in the *Steedman* and *Goodwin* cases. This also showcases the way opinions are formed in the legal sphere where reliance is placed on the product developers’ representations. Possibly, there may be a *Steedman* to *Goodwin* transition phase for autonomous ship cases.

The *Steedman* requirement of a *ship* being ‘used in navigation’ has gone through juridical transformation and does not bring up any technical challenges for an autonomous ship till the same can perform functions closely akin to conventional ships. This must include the ability to make ordered movement in water.

6.2 Part 2 - Reasons for express inclusion of ‘autonomous ships’ in national laws

It is the author’s viewpoint that an express inclusion of autonomous ships will benefit the countries so making this decision, for several reasons:

- a. It will make administering of the admiralty jurisdiction a streamlined and efficient process. This will be one arena where the law can move at the pace of development. Given the fact that *in rem* actions are time sensitive, threatened by the chance of the *ship* sailing away from a jurisdiction and subject to wrongful arrest claims, it will better suit a jurisdiction’s legal system to have prior clarity on the issue. This reason does not come without precedent, as mentioned above, India included hovercrafts in its definition and South Korea included WIG. Hence, there does exist a practice of express inclusion of technologically different ships.
- b. Court’s will save valuable time which would otherwise be spent debating which interpretation to apply, the public law conventions in maritime are purpose built and the private law conventions are silent. The definitions in national laws of each jurisdiction are somewhat different and even within a jurisdiction, there may be a chance that a specific law defines a ‘*ship*’ differently than another law. There is case law wherein English judges have had to differentiate between definitions in two different statutes[43].
- c. Refer to the discussion in *Michael v Musgrove* above, there is proof that even when interpreting international conventions, a domestic court will rely upon the definitions mentioned in the national statutes or case laws.

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- [9] A. Akbar et al. 2020, An economic analysis of introducing autonomous ships in a short-sea liner shipping network. Intl. Trans. in Op. Res. 00 1–25, “In this paper, we do not aim at investigating the technical and design aspects of autonomous ships, but rather on analyzing the economic consequences of utilizing autonomous over conventional ships in future maritime logistics systems.”.
- [10] A. Akbar et al. 2020, An economic analysis of introducing autonomous ships in a short-sea liner shipping network. Intl. Trans. in Op. Res. 00 1–25, “We consider a real case of a Norwegian shipping company that transports containerized goods between Europe and several ports along the Norwegian coast.”.
- [11] It is worth acknowledging that some of the key players promoting autonomous shipping are from the continent. See, Grieg Connect 2020 Autonomous Vessels Meet Autonomous Ports, <https://griegconnect.com/blog/news/autonomous-vessels-meet-autonomous-ports/>.
- [12] See, for United Kingdom Civil Procedure Rules, Part 61 - Admiralty Claims; for Australia, Admiralty Act 1988; for India, The Admiralty (Jurisdiction and Settlement of Maritime Claims) Act, 2017.
- [13] For example, See, The Admiralty (Jurisdiction and Settlement of Maritime Claims) Act, 2017, India, S. 5. “Arrest of vessel in rem.—(1) The High Court may order arrest of any vessel which is within its jurisdiction for the purpose of providing security against a maritime claim which is the subject of an admiralty proceeding.”.
- [14] Indian - The Admiralty (Jurisdiction and Settlement of Maritime Claims) Act, 2017, Section 2(1).
- [15] Korean - Ship Act, Article 1-2.
- [16] International Maritime Organisation 2002 Interim Guidelines for Wing-In-Ground (Wig) Craft (IMO Ref. T4/3.01), http://www.imo.org/blast/blastDataHelper.asp?data_id=6713&filename=1054.pdf.
- [17] Amendments To The International Regulations For Preventing Collisions At Sea, 1972, 2001, Rule 3 (m), [http://www.imo.org/en/knowledgecentre/indexofimoresolutions/assembly/documents/a.910\(22\).pdf](http://www.imo.org/en/knowledgecentre/indexofimoresolutions/assembly/documents/a.910(22).pdf).
- [18] Another author who states that MASS (maritime autonomous surface ship) should be defined in the collision regulations. See, Frederick J F 2019 J. Phys.: Conf. Ser. 1357 012011, A Review of the current Collision Regulations to accommodate Multiple Ship Situations and MASS.
- [19] Hooydonk E V 2014 JIML 403-423, The law of unmanned merchant shipping – an exploration.
- [20] Hooydonk E V 2014 JIML 403-423, “Is the unmanned ship a ship?”
- [21] Showcased in the English judgment of ‘Michael v Musgrove [2012] 2 Lloyd’s Rep. 37 (QBD)’,

which is discussed ahead.

- [22] Veal R & Tsimplis M, 2017 LMCLQ Issue 2 303, The integration of unmanned ships into the lex maritima.
- [23] Indeed, the authors point out that such is the case in English Law.
- [24] The article provides these two sources: See, Statement by Pentagon Press Secretary Peter Cook on Return of U.S. Navy UUV 2016 (<https://www.defense.gov/Newsroom/Releases/Release/Article/1034224/statement-by-pentagon-press-secretary-peter-cook-on-return-of-us-navy-uuv/>), and; Foreign Ministry Spokesperson Hua Chunying's Regular Press Conference on December 19, 2016 (www.fmprc.gov.cn/mfa_eng/xwfw_665399/s2510_665401/t1425479.shtml).
- [25] S Gahlen, (2014) 20 JIML 252, Ships revisited: a comparative study. Veal and Tsimplis caveat this reference by informing that Gahlen's findings are primarily based on European case law.
- [26] Kawasaki, <https://www.kawasaki.com/Category/WATERCRAFT>.
- [27] In this case, guidance published by the Registry of Shipping and Seamen under the heading "Registering Pleasure Vessels".
- [28] The "Von Rocks", [1998] 2 Lloyd's Rep. 198.
- [29] Athens Convention relating to the Carriage of Passengers and their Luggage by Sea (PAL), 1974.
- [30] In concurring with Dr. Hooydonk, this author believes that private international law conventions offer few resources to the discussion on definition of a ship.
- [31] In the judgment, the court has made an internal heading titled 'Particulars of the vessel and the available evidence about operation of Sea Eagle'.
- [32] Since the issue turned on the discussion of the term 'used in navigation'. Refer to discussion in Steedman and Goodwin above.
- [33] An ex-colony of England and that inherited the common law legal system. See, Australian National University, Library Guides, The Australian Legal System.
- [34] For a detailed understanding of size, specification and pictures of the ROV, one may visit the manufacturer's page at: https://www.saabseaeye.com/uploads/seaeye_leopard.pdf.
- [35] Australian - Section 3, The Admiralty Act, 1988.
- [36] The Law Reform Commission Report No 33, Civil Admiralty Jurisdiction (1986) (Report).
- [37] For discussion on this aspect by the Supreme Court of India. See, M.V. Elisabeth And Ors vs Harwan Investment And Trading, 1993 AIR 1014.
- [38] It relied on the judgment of Elbe Shipping SA v The Ship 'Global Peace' [2006] FCA 954; (2006) 154 FCR 439 at [74] (Allsop J).
- [39] Cyber Sea Technologies Inc v Underwater Harvester Remotely Operated Vehicle 2002 FCT 794.
- [40] Section 2 of the Canadian Federal Courts Act defines a 'ship' as follows: "any vessel or craft designed, used or capable of being used solely or partly for navigation, without regard to method or lack of propulsion, and includes...".
- [41] There is support to this argument from voices in Canada. See, The Canadian Maritime Law Association, CMI Questionnaire On Unmanned Cargo Ships, <https://comitemaritime.org/wp-content/uploads/2018/05/CMI-IWG-Questionnaire-Unmanned-Ships-CANADA.pdf>.
- [42] For technical specifications of one such project, See, Kongsberg, Autonomous Ship Project, Key Facts About Yara Birkeland: <https://www.kongsberg.com/maritime/support/themes/autonomous-ship-project-key-facts-about-yara-birkeland/>.
- [43] The Environment Agency v Mr Christopher Gibbs, Mr Glen Parker [2016] EWHC 843 (Admin).