

# WHEN IS A SHIP A SHIP? USE BY STATE ARMED FORCES OF UNCREWED MARITIME VEHICLES AND THE *UNITED NATIONS CONVENTION ON THE LAW OF THE SEA*

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*Armed forces around the world are rapidly developing uncrewed maritime vehicles ('UMVs') for use in military operations. Key to the strategic value of UMVs is that they will have no people on board and instead be remotely controlled or, in the future, be capable of carrying out some or all of their mission autonomously. But will they fit into the existing categories of the law of the sea set out in the United Nations Convention on the Law of the Sea ('UNCLOS')? This article considers whether two of the basic classifications of this body of law — being categorised as a 'ship' or 'vessel' and being a 'warship' — require people to be on board the vehicle and thus exclude UMVs. These categories are critical for the distribution of rights and obligations in UNCLOS. Failing to qualify as a ship would significantly limit the strategic value of UMVs, restricting their navigational rights and possibly preventing states from claiming sovereign immunity.*

*Along with the important practical implications of these definitional challenges, they also serve as an example of when an evolutionary interpretation of international treaty law should be preferred. The article shows that the better interpretation of 'ship' in UNCLOS is capacious enough to include both remotely controlled and autonomous UMVs. However, the more restrictive definitional requirements of 'warship' in UNCLOS will be more difficult for UMVs to meet.*

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## I INTRODUCTION

So long-range unmanned surface vessels, for us, [are] vitally important because they're lethal. They're not just connectors; they're sniffers, they're out there telling me what's going on, they're passing that information back to me, and they're spreading out the enemy because at some point you've got to target everything that moves because the one thing that does get through is carrying the lethal package.

— Lieutenant General Eric Smith, Deputy Commandant of the United States Marine Corps for Combat Development and Integration<sup>1</sup>

Armed forces around the world are rapidly developing uncrewed maritime vehicles ('UMVs') for use in military operations. Key to the strategic value of UMVs is that they will have no people on board and instead be remotely controlled or, in the future, be capable of carrying out some or all of their mission autonomously. But will they fit into the existing categories of the law of the sea? This article will consider whether two of the basic classifications of this body of law — being categorised as a 'ship' or 'vessel' and being a 'warship' under the *United Nations Convention on the Law of the Sea* ('UNCLOS')<sup>2</sup> — require people to be on board the vehicle and thus exclude UMVs.

The category of 'ship'/'vessel' is critical for the distribution of rights and obligations in *UNCLOS*, which is the most important treaty in the law of the sea and is recognised as being broadly reflective of customary international law.<sup>3</sup> Many of the provisions of *UNCLOS*, including those on navigational rights, only apply to either ships or vessels. As these terms are used interchangeably in the Convention and refer to the same concept,<sup>4</sup> this article will use the word 'ship' to refer to both. Failing to qualify as a ship would significantly limit the strategic value of UMVs, restricting their navigational rights under *UNCLOS* and possibly preventing states from claiming sovereign immunity. Moreover, finding that UMVs do not amount to a 'ship' under *UNCLOS* would be strong evidence that the same would be true in any residual category of 'ship' in customary international law. After setting out some background information about the military use of UMVs, it will be shown that the better interpretation of 'ship' in *UNCLOS* is capacious enough to include both remotely controlled and autonomous UMVs. This does not mean that *all* UMVs will necessarily be ships; this would depend on whether they were classified as a ship by a state through

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<sup>1</sup> Megan Eckstein, 'Navy, Marines Moving Ahead with Unmanned Vessel Programs', *USNI News* (online, 31 October 2019) <<https://news.usni.org/2019/10/31/navy-marines-moving-ahead-with-unmanned-vessel-programs>>, archived at <<https://perma.cc/53NB-RFKY>>.

<sup>2</sup> *United Nations Convention on the Law of the Sea*, opened for signature 10 December 1982, 1833 UNTS 396 (entered into force 16 November 1994) ('UNCLOS').

<sup>3</sup> See Robin R Churchill, 'The 1982 United Nations Convention on the Law of the Sea' in Donald R Rothwell et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015) 24, 37–8. See also J Ashley Roach, 'Today's Customary International Law of the Sea' (2014) 45(3) *Ocean Development and International Law* 239 for a detailed examination of what parts of *UNCLOS* have been recognised by international tribunals as reflecting customary international law.

<sup>4</sup> Satya N Nandan and Shabtai Rosenne, *United Nations Convention on the Law of the Sea 1982: A Commentary* (Martinus Nijhoff Publishers, 1985–2011) vol 2, 45. More will be said on this later.

registration, a decision that would be made according to national law and the planned use of the device.

If UMVs do qualify as ships, a secondary question is whether they can be categorised as ‘warships’ and consequently have access to belligerent rights. *UNCLOS* specifically defines ‘warship’ in art 29, setting requirements that could be difficult for a UMV to meet. The provision explicitly states that a warship must have a crew under regular armed forces discipline and be commanded by a military officer.<sup>5</sup> However, the history of the definition of ‘warship’ demonstrates that the object and purpose of the provision supports a more flexible interpretation, particularly in light of the regulatory challenge that the definition was seeking to solve.

These definitional challenges serve as an example of when an evolutionary interpretation of international treaty law should be preferred. The analysis shows that taking an expansive approach and including UMVs in the category of ‘ship’ in *UNCLOS* is consistent with the principles of treaty interpretation and the principles of the law of the sea. However, their inclusion in the definition of ‘warship’ is more of a stretch.

The focus on the categories of ‘ship’ and ‘warship’ in *UNCLOS* is necessary given that outside this convention there is insufficient state practice and *opinio juris* to provide a basis for recognising the rights of UMVs in customary international law. The limited (public) use by state armed forces of UMVs in contested areas means that their rights and obligations have not been clarified through the response of other states to their use.<sup>6</sup> Even if we limit the analysis to the provisions of *UNCLOS*, there is no settled view amongst states and international lawyers about where these devices can go and what they can do when they are there. While some states would be in favour of including UMVs in these categories, others may prefer to limit the navigational and belligerent rights that UMVs hold.<sup>7</sup> This creates a real risk of conflict where states have different views about the categorisation of a UMV. This has already happened, most prominently after the Chinese capture of an American UMV in the South China Sea in December 2016.<sup>8</sup>

Instead of waiting for the formation of new customary international law (or a treaty) outside of the *UNCLOS* regime to clarify the situation, recognising that UMVs can fit within existing regulation is the best way to ensure their safe and predictable operation in the ocean. The increased use of these devices and the ambiguous legal situation make it more important for states to be public with their interpretations of *UNCLOS*. The best way to reduce the risk of future conflict,

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<sup>5</sup> *UNCLOS* (n 2) art 29.

<sup>6</sup> Robert Veal, Michael Tsimplis and Andrew Serdy, ‘The Legal Status and Operation of Unmanned Maritime Vehicles’ (2019) 50(1) *Ocean Development and International Law* 23, 24.

<sup>7</sup> Michael N Schmitt and David S Goddard, ‘International Law and the Military Use of Unmanned Maritime Systems’ (2016) 98(2) *International Review of the Red Cross* 567, 577.

<sup>8</sup> James Kraska and Raul Pedrozo, ‘China’s Capture of US Underwater Drone Violates Law of the Sea’, *Lawfare* (Blog Post, 16 December 2016) <<https://www.lawfareblog.com/chinas-capture-us-underwater-drone-violates-law-sea>>, archived at <<https://perma.cc/SP6K-N8A5>>; Veal, Tsimplis and Serdy (n 6) 24–5; Melissa de Zwart, ‘New Technologies and the Law of Naval Warfare’ in Dale Stephens and Matthew Stubbs (eds), *The Law of Naval Warfare* (LexisNexis Butterworths, 2019) 305, 308.

or at least understand when it is likely to occur, is for states to follow the lead of the United States and make their view of the legal definition clear.

## II MILITARY USE OF UNCREWED MARITIME VEHICLES

States have developed and are already using UMVs, and their use will continue to expand in the future.<sup>9</sup> State armed forces currently use UMVs for surveillance and reconnaissance, hydrographic surveying, mine countermeasures and special operations, as well as in restricted areas where the risk of collision is manageable.<sup>10</sup> The US Navy is seeking funding to build a ‘ghost fleet’ of autonomous maritime vehicles,<sup>11</sup> suggesting that in the not-too-distant future, units and divisions of state armed forces will be capable of traversing the ocean, carrying out missions and destroying targets, all without people on board. While this is unlikely in the short term,<sup>12</sup> it is clear that UMVs have significant advantages over their crewed counterparts for certain missions: they can be deployed for longer, be designed to operate more stealthily and remove the need for military personnel to be in dangerous environments.<sup>13</sup> Uncrewed autonomous technology is also being developed for commercial shipping.<sup>14</sup>

It is important to be precise about the differences between UMVs and previous advances in military technology, which this article will focus on. It is not about the autonomy itself or the machines and systems that impact on human choices by providing filtered data to decision-makers. After all, there are other components of military vessels — like the AEGIS missile defence system that automatically

<sup>9</sup> Andrew Norris, *Legal Issues Relating to Unmanned Maritime Systems Monograph* (Report, 2013) 1–2; Bradley Martin et al, ‘Advancing Autonomous Systems: An Analysis of Current and Future Technology for Unmanned Maritime Vehicles’ (Research Report, 2019).

<sup>10</sup> Department of the Navy (US), *The Commander’s Handbook on the Law of Naval Operations* (2017) 2-3 [2.3.4] (‘*US Navy Commander’s Handbook*’). See also Veal, Tsimplis and Serdy (n 6) 24; Schmitt and Goddard (n 7) 570; Wolff Heintschel von Heinegg, ‘Naval Technologies’ in William H Boothby (ed), *New Technologies and the Law in War and Peace* (Cambridge University Press, 2019) 315, 318–19.

<sup>11</sup> Sam LaGrone, ‘Navy Wants 10-Ship Unmanned “Ghost Fleet” to Supplement Manned Force’, *USNI News* (online, 13 March 2019) <<https://news.usni.org/2019/03/13/navy-wants-ten-ship-3b-unmanned-experimental-ghost-fleet>>, archived at <<https://perma.cc/H348-H54M>>; David B Larter, ‘A Classified Pentagon Maritime Drone Program Is About to Get Its Moment in the Sun’, *Defense News* (online, 14 March 2019) <<https://www.defensenews.com/naval/2019/03/14/a-classified-pentagon-maritime-drone-program-is-about-to-get-its-moment-in-the-sun/>>, archived at <<https://perma.cc/F7EK-4R2K>>; Sebastien Roblin, ‘The Navy’s Phantom Ghost Fleet Problem: They Aren’t Yet Considered “Ships”’, *The National Interest* (Blog Post, 11 January 2020) <<https://nationalinterest.org/blog/buzz/navy%E2%80%99s-phantom-ghost-fleet-problem-they-aren%E2%80%99t-yet-considered-ships-112991>>, archived at <<https://perma.cc/QF2L-YVBG>>. See also Erich D Grome, ‘Spectres of the Sea: The United States Navy’s Autonomous Ghost Fleet, Its Capabilities and Impacts, and the Legal Ethical Issues That Surround’ (2018) 49(1) *Journal of Maritime Law and Commerce* 31. Erich D Grome uses the phrase ‘ghost fleet’ to refer to ‘a collection of autonomous vessels, submarines, and aerial drones and the specific armada that some at the Pentagon proposed’: at 32 n 1.

<sup>12</sup> Martin et al (n 9) xi.

<sup>13</sup> de Zwart (n 8) 309–10; Schmitt and Goddard (n 7) 570.

<sup>14</sup> Paul Dean and Henry Clack, ‘Autonomous Shipping and Maritime Law’ in Barış Soyer and Andrew Tettenborn (eds), *New Technologies, Artificial Intelligence and Shipping Law in the 21<sup>st</sup> Century* (Informa Law, 2020) 67, 67–70.

detects and destroys missiles attacking a warship<sup>15</sup> — that are pre-programmed and, when switched on, are largely autonomous. Military vessels have an array of sensors and other devices to assist in navigation and threat detection that help the people on board complete their mission. Computer systems play an increasing role in sorting and processing the data that is collected by sensors and in showing the human operator only the most important information. These technological developments can be seen as a continuation of previous developments that assist seafarers to navigate; sextants, telescopes and navigational charts all provide the commander of a ship with selected information that then allows them to make a decision about how to complete the mission while on board the ship.

Instead, this article focuses on the legal consequences of UMVs having no people on board. Wolff Heintschel von Heinegg offers a usefully concise definition of UMVs that this article will adopt:

[UMVs are] self-propelled or remotely-navigated craft that are normally recoverable and designed to perform functions at sea by operating on the surface, semi-submerged or undersea. [UMVs] either are remotely operated or remotely controlled, or they perform some or all of their functions independently from a human controller or operator.<sup>16</sup>

UMVs come in many forms.<sup>17</sup> Some operate on the surface, others under the surface.<sup>18</sup> Some are remotely controlled from the shore or another ship through cable, by radio communication or by GPS coordinates, aided by cameras and other sensors that are transmitted back to the command centre.<sup>19</sup> Others are pre-programmed to follow a particular route without human intervention, relying on onboard algorithms to avoid collision.<sup>20</sup> At their most basic, they include floats and gliders, which have been used for decades in marine scientific research and maritime surveying.<sup>21</sup> In the future, some UMVs will be capable of operating in a variety of ways: autonomously, remotely or with a human on board. For example, sensitive and complex tasks (such as entering a busy harbour space) might be carried out by a pilot, whereas sea voyage might be more autonomous.<sup>22</sup>

There are several examples of existing and proposed UMVs that give some sense of the variety of devices under development. In January 2019, it was announced that the first US prototype of a submarine-hunting UMV, named Sea Hunter, successfully sailed from San Diego to Hawaii and back without any crew

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<sup>15</sup> 'AEGIS Weapon System', *United States Navy* (Web Page, 10 January 2019) <<https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166739/aegis-weapon-system/>>, archived at <<https://perma.cc/PLN4-4X7N>>.

<sup>16</sup> Heintschel von Heinegg, 'Naval Technologies' (n 10) 319.

<sup>17</sup> See Martin et al (n 9) 5–28; Eric Van Hooydonk, 'The Law of Unmanned Merchant Shipping: An Exploration' (2014) 20(3) *Journal of International Maritime Law* 403, 403–6.

<sup>18</sup> Veal, Tsimplis and Serdy (n 6) 23.

<sup>19</sup> *Ibid.* 24.

<sup>20</sup> *Ibid.*

<sup>21</sup> Katharina Bork et al, 'The Legal Regulation of Floats and Gliders: In Quest of a New Regime?' (2008) 39(3) *Ocean Development and International Law* 298, 299–300. See also Hitoshi Nasu and David Letts, 'The Legal Characterization of Lethal Autonomous Maritime Systems: Warship, Torpedo, or Naval Mine?' (2020) 96 *International Law Studies* 79, 80–1, who trace the lineage of UMVs much further to fireships deployed in pre-modern naval warfare.

<sup>22</sup> Henrik Ringbom, 'Regulating Autonomous Ships: Concepts, Challenges and Precedents' (2019) 50(2–3) *Ocean Development and International Law* 141, 143.

on board.<sup>23</sup> Sea Hunter is 40 m long, is capable of travelling at a speed of 27 kn and is designed to detect and track an enemy submarine until it can be intercepted and destroyed by a friendly warship or aircraft.<sup>24</sup> This is only a taste of what is to come: the US Navy has sought funding for even larger UUVs that will be the size of a corvette (a small warship).<sup>25</sup> At the smaller and slower end of the scale, Liquid Robotics' Wave Gliders are just over three metres long and have an average speed of 1.3 kn.<sup>26</sup> Using wave motion to provide the energy needs of the device, they can be used for persistent surveillance to detect submarines or surface vehicles, in reconnaissance and as a communications gateway.<sup>27</sup>

While these devices are described in media reports and company marketing as autonomous, what it means to be 'autonomous' is contested. The lack of a common understanding of the concept makes meaningful discussion about what constraints (if any) should be put on the autonomous capacity of devices more difficult.<sup>28</sup> This is not due to a lack of effort in clarifying the situation. There have been many attempts made to identify different levels of autonomy, and the results vary widely, with some scales having as few as three levels<sup>29</sup> and others as many as 10.<sup>30</sup> The use of a scale of autonomy for a single device may, however, be misleading: the device might be run by a system made up of several components, each carrying out different tasks with different levels of human intervention.<sup>31</sup> After all, a device that operates remotely will have to have some capacity to operate autonomously in case the communication link is broken with the onshore crew.<sup>32</sup> This can be seen in the scale for 'maritime autonomous surface ships' adopted by the Maritime Safety Committee of the International Maritime Organisation ('IMO'). The scale

<sup>23</sup> Franz-Stefan Gady, 'US Navy's Anti-Submarine Drone Ship Sailed Autonomously from San Diego to Hawaii and Back', *The Diplomat* (online, 6 February 2019) <<https://thediplomat.com/2019/02/us-navys-anti-submarine-drone-ship-sailed-autonomously-from-san-diego-to-hawaii-and-back/>>, archived at <<https://perma.cc/L7Q3-6BCL>>.

<sup>24</sup> Ibid.

<sup>25</sup> Ronald O'Rourke, 'Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress' (Research Report No R45757, Congressional Research Service, United States Congress, 23 December 2020) 7. Ronald O'Rourke explains that the US Navy envisioned the large UUVs being 200 ft (60 m) to 300 ft (90 m) in length and having a full load displacement of about 2,000 t.

<sup>26</sup> 'How It Works', *Liquid Robotics* (Web Page) <<https://www.liquid-robotics.com/wave-glider/how-it-works/>>, archived at <<https://perma.cc/6HDD-PFA2>>.

<sup>27</sup> 'Defense & Security', *Liquid Robotics* (Web Page) <<https://www.liquid-robotics.com/markets/defense-security/>>, archived at <<https://perma.cc/L8BU-MZHQ>>.

<sup>28</sup> This is particularly true in the debate about the legality of lethal autonomous weapons. For a useful overview, see Merel Alexandra Clementine Ekelhof, 'The Distributed Conduct of War: Reframing Debates on Autonomous Weapons, Human Control and Legal Compliance in Targeting' (PhD Thesis, Vrije Universiteit Amsterdam, 2019) 71–4; Merel AC Ekelhof, 'Complications of a Common Language: Why It Is So Hard to Talk about Autonomous Weapons' (2017) 22(2) *Journal of Conflict and Security Law* 311.

<sup>29</sup> Craig H Allen, 'Determining the Legal Status of Unmanned Maritime Vehicles: Formalism vs Functionalism' (2018) 49(4) *Journal of Maritime Law and Commerce* 477, 486.

<sup>30</sup> Martin et al (n 9) 6–7; Jenay M Beer, Arthur D Fisk and Wendy A Rogers, 'Toward a Framework for Levels of Robot Autonomy in Human–Robot Interaction' (2014) 3(2) *Journal of Human–Robot Interaction* 74, 78. See also Robert Veal and Michael Tsimplis, 'The Integration of Unmanned Ships into the *Lex Maritima*' (2017) *Lloyd's Maritime and Commercial Law Quarterly* 303, 306.

<sup>31</sup> Martin et al (n 9) 7.

<sup>32</sup> Ringbom (n 22) 147. See also Veal and Tsimplis (n 30) 306, who describe a process where, when a remotely controlled device loses contact with the controller, the system 'automatically guides the craft to a specific location where it stops and awaits recovery'.

recognises that there will be a distinction between ships with automated processes and decision support assisting the crew, remotely controlled ships with crew on board, remotely controlled ships without a crew onboard and fully autonomous ships.<sup>33</sup> While their focus is on the non-military application of the technology, this scale gives a sense of the different ways that autonomous navigation will be operationalised in ships and vessels. This article is focused on addressing the third and fourth classes by examining what happens to the categorisation of a device when there are no people on board. Beyond this, it is unnecessary to take a view of the meaning of ‘autonomy’ for the purpose of this article.

While distinguishing between remotely controlled and more ‘autonomous’ devices is not critical for assessing whether the devices can qualify as a ‘ship’ (particularly as it seems that most UMVs are likely to have a mix of remotely controlled and autonomous functionality),<sup>34</sup> the article will identify some of the legal requirements that will be more straightforward for a remotely controlled UMV to satisfy. The distinction between autonomous and remotely controlled devices is potentially more significant when it comes to the definition of ‘warships’.

### III THE STATUS OF UMVs

#### A *Why Does It Matter whether They Can Be Classified as a Ship?*

##### 1 *Key Navigational Rights Are Only Available to Ships*

The missions that UMVs can be tasked with will be in part determined by where they can lawfully travel in the ocean. The key navigational rights that allow maritime vehicles to move through the territorial sea of other states are set out in *UNCLOS* and are only available to ships, not to other ocean-going devices.<sup>35</sup> A UMV being categorised as a ‘ship’ means that it has access to established rights of navigation and will be subject to widely accepted international standards.<sup>36</sup> Access to these rights will substantially increase UMV utility to militaries.<sup>37</sup>

Put simply, categorisation as a ‘ship’ or a ‘vessel’ allows for a much more straightforward assessment of what the device can do, where it can go and how other states can respond to it.<sup>38</sup> The navigational rights provided by *UNCLOS* are one of the central mechanisms of the regulation of maritime spaces, and they allow ships to travel through the territorial waters of other states. *UNCLOS* provides multiple navigational rights that differ depending on the jurisdictional zone of the

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<sup>33</sup> See Simon Baughen, ‘Who Is the Master Now? Regulatory and Contractual Challenges of Unmanned Vessels’ in Barış Soyer and Andrew Tettenborn (eds), *New Technologies, Artificial Intelligence and Shipping Law in the 21<sup>st</sup> Century* (Informa Law, 2020) 129. This division is echoed in the four classes identified by Paul Dean and Henry Clack: Dean and Clack (n 14) 68–9.

<sup>34</sup> It is however an important distinction for other regulatory purposes, particularly in civil maritime regulation: see Robert Veal and Henrik Ringbom, ‘Unmanned Ships and the International Regulatory Framework’ (2017) 23(2) *Journal of International Maritime Law* 100.

<sup>35</sup> *UNCLOS* (n 2) art 17.

<sup>36</sup> Veal, Tsimplis and Serdy (n 6) 39–40; Nasu and Letts (n 21) 91–2.

<sup>37</sup> Norris (n 9) 36.

<sup>38</sup> Veal, Tsimplis and Serdy (n 6) 25.

ocean: innocent passage, transit passage, archipelagic sea lane passage and, in the high seas, freedom of navigation.<sup>39</sup> *UNCLOS*, representing a compromise between the interests of maritime powers and coastal states, sets the conditions under which ships and vessels can exercise those rights.<sup>40</sup> Understanding the operation of those rights, and the limitations that are placed on how they are exercised, allows for a full appreciation of the clarity that follows from classifying a UMV as a ship under *UNCLOS*.

Innocent passage, which became established in the mid-19<sup>th</sup> century,<sup>41</sup> allows ships to navigate within the territorial sea<sup>42</sup> of a foreign coastal state,<sup>43</sup> reconciling the territorial sovereignty of the coastal state with access by other states.<sup>44</sup> Passage must be continuous and expeditious, and it must be for the purpose of entering or leaving internal waters or passing through without entering internal waters.<sup>45</sup> To qualify as ‘innocent’, the passage must not be prejudicial to the peace, good order or security of the coastal state.<sup>46</sup> Article 19 of *UNCLOS* sets out a list of activities that are considered prejudicial, most of which relate to military purposes. These include activities that might be undertaken by U MVs, including any threat or use of force, any exercise or practice with weapons, the collection of information to the prejudice of the defence or security of the coastal state or the carrying out of research or survey activities.<sup>47</sup> Innocent passage requires submarines and underwater vehicles to travel on the surface and to show their flag.<sup>48</sup> There is no support in *UNCLOS* or customary international law for the entitlement of a non-vessel ‘object’ or ‘device’ to access the right of innocent passage, and there is no other legal mechanism that would allow such a device to enter the territorial sea of another state.<sup>49</sup>

Coastal states are permitted to regulate how the right of innocent passage is exercised in their territorial waters to ensure navigational and maritime safety. This regulation is not, however, permitted to extend to the design, construction and crewing of foreign ships unless it is giving effect to generally accepted international standards.<sup>50</sup> It means that all ships — including any U MVs that fall into this category — will be required to comply with these generally accepted standards. It appears that it would be possible for U MVs to meet the requirements of the main sources of these standards (the *International Convention for the Safety of Life at Sea*<sup>51</sup> regime and the *Convention on the International Regulations for*

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<sup>39</sup> Yoshifumi Tanaka, ‘Navigational Rights and Freedoms’ in Donald R Rothwell et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015) 536, 537.

<sup>40</sup> See generally Tanaka (n 39).

<sup>41</sup> *Ibid* 540.

<sup>42</sup> The territorial sea is an area up to 12 mi from the baseline — generally the low-water line — of the coastal state.

<sup>43</sup> *UNCLOS* (n 2) art 17.

<sup>44</sup> Tanaka (n 39) 539.

<sup>45</sup> *UNCLOS* (n 2) art 18.

<sup>46</sup> *Ibid* art 19.

<sup>47</sup> *Ibid*. See also Nandan and Rosenne (n 4) 166.

<sup>48</sup> *UNCLOS* (n 2) art 20.

<sup>49</sup> Norris (n 9) 33–4.

<sup>50</sup> *UNCLOS* (n 2) art 21(2).

<sup>51</sup> *International Convention for the Safety of Life at Sea*, opened for signature 1 November 1974, 1184 UNTS 2 (entered into force 25 May 1980) (‘*SOLAS*’).



*Preventing Collisions at Sea* ('COLREGs')<sup>52</sup>).<sup>53</sup> If this is correct, it means that coastal states will not be permitted to unilaterally put in place a requirement that all vessels carry a commander and crew, which would in effect prohibit the passage of any UUVs.<sup>54</sup> More will be said on this below.

Transit passage and archipelagic sea lane passage are variations to the innocent passage regime that were negotiated during the drafting of *UNCLOS*. Transit passage allows ships to navigate in straits 'used for international navigation between one part of the high seas or an exclusive economic zone and another part of the high seas or an exclusive economic zone'.<sup>55</sup> A compromise was necessary because *UNCLOS* permitted coastal states to expand their territorial sea claim from three nautical miles from their baseline (generally the low-water mark) to 12 nautical miles, leaving no open ocean available for navigation in some critical international straits.<sup>56</sup> This outcome was detrimental to maritime powers, as ships engaging in innocent passage are seriously limited in the activities they can carry out, leaving naval vessels unable to sufficiently protect themselves and requiring submarines to surface.<sup>57</sup> The compromise between these two interests reached at *UNCLOS* was transit passage, a non-suspendable right that allows for ships and aircraft to travel without delay through or over the strait in normal navigational mode.<sup>58</sup> Normal navigational mode is generally understood to mean that submarines can continue travelling underwater and surface ships can undertake activities necessary for their security that would not be permissible in innocent passage.<sup>59</sup> Archipelagic sea lane passage is analogous to transit passage and allows an archipelagic state to set aside sea lanes and air routes through its archipelagic waters<sup>60</sup> and the adjoining territorial sea.<sup>61</sup> As with transit passage, ships and vessels have the right to navigate through these sea lanes in normal mode.<sup>62</sup> Both navigational rights are only available to ships and vessels.

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<sup>52</sup> *Convention on the International Regulations for Preventing Collisions at Sea*, opened for signature 20 October 1972, 1050 UNTS 16 (entered into force 15 July 1977) ('COLREGs').

<sup>53</sup> Veal, Tsimplis and Serdy (n 6) 33, 37.

<sup>54</sup> *Ibid.*

<sup>55</sup> *UNCLOS* (n 2) art 37.

<sup>56</sup> John E Noyes, 'The Territorial Sea and Contiguous Zone' in Donald R Rothwell et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015) 91, 93–4; Norris (n 9) 37.

<sup>57</sup> Norris (n 9) 37.

<sup>58</sup> *UNCLOS* (n 2) arts 38–9.

<sup>59</sup> Noyes, 'The Territorial Sea and Contiguous Zone' (n 56) 98–9; Norris (n 9) 38.

<sup>60</sup> Archipelagic waters are determined by drawing straight baselines connecting the outer edges of qualifying islands in an archipelago: see *UNCLOS* (n 2) art 47.

<sup>61</sup> Tara Davenport, 'The Archipelagic Regime' in Donald R Rothwell et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015) 134, 149–50.

<sup>62</sup> *UNCLOS* (n 2) art 53.

## 2 *All State Ships Operated by States for Non-Commercial Purposes Will Have Sovereign Immunity*

A second consequence of categorisation as a ‘ship’ is the applicability of sovereign immunity. Ships operated by governments for non-commercial purposes or that qualify as warships have sovereign immunity.<sup>63</sup> This means that they cannot be subject to the jurisdiction of other states, even when they are in those states’ territorial waters.<sup>64</sup> More specifically, sovereign immunity means that a ship cannot be subject to enforcement actions by other states.<sup>65</sup> In line with art 32 of *UNCLOS*, sovereign immunity continues to apply while in the territorial sea of a foreign state and during innocent passage. There are some conditions: a warship that does not comply with the coastal state regulations of innocent passage may be required to depart the territorial sea immediately, and the flag state is responsible for any damage caused during innocent passage that results from a failure to follow the applicable rules.<sup>66</sup> If a state finds a foreign device in its territorial waters that it does not consider to be a ship or vessel, it may be entitled to exercise its full legislative and enforcement jurisdiction over the device (although this is contested).<sup>67</sup>

### B *Are UMs Ships?*

There is no uniform legal definition of ‘ship’ in *UNCLOS*, in other treaties or in customary international law, making it difficult to determine whether UMs will fall into this category.<sup>68</sup> This is particularly because one of the assumptions made about the operation of ships — mainly due to technical limitations — is that they will have people on board.<sup>69</sup> If this assumption means that having a crew or commander on board the device is a critical component of being a ship, UMs will not satisfy the definition, and it will be more difficult to fit them into the *UNCLOS* regime.<sup>70</sup> The scholarly debate about this question is testament to this

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<sup>63</sup> See *ibid* arts 32, 95–6, 236; Norris (n 9) 27; James Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (2010) 5(3) *Journal of Ocean Technology* 44, 56; James Kraska, ‘Military Operations’ in Donald R Rothwell et al (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, 2015) 866, 871–2.

<sup>64</sup> Kraska, ‘Military Operations’ (n 63) 872; Norris (n 9) 41.

<sup>65</sup> *UNCLOS* (n 2) arts 32, 95–6, 236.

<sup>66</sup> *Ibid* arts 30–1.

<sup>67</sup> For a good overview of this issue, see Norris (n 9) 41–6. Most scholars seem to accept that sovereign immunity is dependent on a device being classified as a ship: see, eg, Matt Bartlett, ‘Game of Drones: Unmanned Maritime Vehicles and the Law of the Sea’ (2018) 24 *Auckland University Law Review* 66, 77–8; Oliver Daum, ‘The Implications of International Law on Unmanned Naval Craft’ (2018) 49(1) *Journal of Maritime Law and Commerce* 71, 97–8; Natalie Klein, ‘Maritime Autonomous Vehicles within the International Law Framework to Enhance Maritime Security’ (2019) 95 *International Law Studies* 244, 267–8. Others argue that as a UMV will be the property of a state used for non-commercial purposes, it will still have sovereign immunity: Wolff Heintschel von Heinegg, ‘Unmanned Maritime Systems: Does the Increasing Use of Naval Weapon Systems Present a Challenge for IHL?’ in Wolff Heintschel von Heinegg, Robert Frau and Tassilo Singer (eds), *Dehumanization of Warfare: Legal Implications of New Weapon Technologies* (Springer, 2018) 119, 122 (‘Unmanned Maritime Systems’); Nasu and Letts (n 21) 90–1.

<sup>68</sup> Veal, Tsimplis and Serdy (n 6) 26; Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 63) 51; Norris (n 9) 24.

<sup>69</sup> Norris (n 9) 26; Allen (n 29) 483; Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 67) 121.

<sup>70</sup> de Zwart (n 8) 312.

uncertainty,<sup>71</sup> and the ambiguity increases the risk that the categorisation of a device could differ between states and result in conflict.<sup>72</sup>

This dispute is partly about whether an expansive and evolutionary interpretation of ‘ship’ in *UNCLOS* is permissible in the face of the new technology of UMVs. As noted above, ‘ship’ is not defined in *UNCLOS* and is used interchangeably with ‘vessel’. It is clear that ship and vessel refer to the same concept: the authentic treaty texts in French and Spanish only use one word — *navire* and *buque* respectively.<sup>73</sup> *UNCLOS* does recognise that there may be other objects using the ocean by establishing rules for devices and equipment, particularly for use in marine scientific research but does not provide a clear way of distinguishing them from ships.<sup>74</sup> We are left with the word ‘ship’, the contexts in which it is used in *UNCLOS* and the method of treaty interpretation provided by the *Vienna Convention on the Law of Treaties* (‘*VCLT*’) — looking at the text of the convention, its object and purpose, and interpreting it in good faith.

### 1 *An Evolutionary Approach to UNCLOS Is Justified*

Interpreting the term ‘ship’ in *UNCLOS* to encompass the new(ish) technology of UMVs is an example of an evolutionary interpretation. An evolutionary interpretation recognises that, in some contexts, the terms of a treaty are not fixed once and for all but can change through time.<sup>75</sup> Of course, it is not appropriate to take an evolutionary approach to all terms in every treaty; it depends on the terms used, the subject matter of the treaty and, most importantly, on whether this approach would be consistent with the intention of the parties. The ‘intention’ of the parties as understood through the treaty interpretation process is not necessarily the subjective intention of the parties; rather, the process of interpretation aims to discover the ‘objective’ intention of the parties. The legally recognised way of determining the objective intention of the parties is by applying the *VCLT*, looking at the treaty’s text, its object and purpose, and interpreting it in good faith.<sup>76</sup>

The International Court of Justice (‘ICJ’) in *Dispute regarding Navigational and Related Rights* sets out when the Court would apply a presumption in favour of an evolutionary interpretation:

[W]here the parties have used generic terms in a treaty, the parties necessarily having been aware that the meaning of the terms was likely to evolve over time,

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<sup>71</sup> Schmitt and Goddard (n 7); Bartlett (n 67); Grome (n 11); Rob McLaughlin, ‘Unmanned Naval Vehicles at Sea: USVs, UUVs, and the Adequacy of the Law’ (2011) 21(2) *Journal of Law, Information and Science* 100 (‘Unmanned Naval Vehicles at Sea’); Veal, Tsimplis and Serdy (n 6); Norris (n 9); Daum (n 67); Robert McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ in Hitoshi Nasu and Robert McLaughlin (eds), *New Technologies and the Law of Armed Conflict* (Asser Press, 2014) 229; Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 63); Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 67); Klein (n 67).

<sup>72</sup> Veal, Tsimplis and Serdy (n 6) 25–6; Bartlett (n 67) 81–6.

<sup>73</sup> Nandan and Rosenne (n 4) 45–6. See also John E Noyes, ‘Interpreting the 1982 Law of the Sea Convention and Defining Its Terms’ in George K Walker (ed), *Definitions for the Law of the Sea: Terms Not Defined by the 1982 Convention* (Martinus Nijhoff Publishers, 2012) 45, 56–7.

<sup>74</sup> Veal, Tsimplis and Serdy (n 6) 25.

<sup>75</sup> Eirik Bjorge, *The Evolutionary Interpretation of Treaties* (Oxford University Press, 2014) 59.

<sup>76</sup> *Ibid* 57–9.

and where the treaty has been entered into for a very long period or is ‘of continuing duration’, the parties must be presumed, as a general rule, to have intended those terms to have an evolving meaning.<sup>77</sup>

The ICJ also adopted an evolutionary understanding of treaty terms in *Legal Consequences for States of the Continued Presence of South Africa in Namibia*,<sup>78</sup> *Aegean Sea Continental Shelf*,<sup>79</sup> *Gabčíkovo–Nagymaros Project*<sup>80</sup> and *Pulp Mills on the River Uruguay*,<sup>81</sup> all on the basis of the intention of the parties.

There are strong indications that the parties to *UNCLOS* intended that its terms be interpreted in this way.<sup>82</sup> The preamble to *UNCLOS* reveals the high hopes of the parties: it was prompted by a ‘desire to settle ... all issues relating to the law of the sea’.<sup>83</sup> It recognises that the ‘problems of ocean space are closely interrelated and need to be considered as a whole’<sup>84</sup> and that ‘the codification and progressive development of the law of the sea’ in *UNCLOS* will strengthen peace and security.<sup>85</sup> The broad scope of *UNCLOS* also suggests that the very significant threshold question of what amounts to a ship should be read widely. *UNCLOS* has been described as a ‘constitution for the oceans’<sup>86</sup> and has ‘innate constitutional attributes’, such as not allowing reservations (art 309) and making amendment difficult (art 312).<sup>87</sup> These features suggest that an expansive and evolving definition of the word ‘ship’ should be preferred, as this approach would be most likely to fulfil this vision.

The word ‘ship’ is also conducive to a broad interpretation. It is a generic word and can refer to a wide range of devices, from large commercial container ships

<sup>77</sup> *Dispute regarding Navigational and Related Rights (Costa Rica v Nicaragua) (Judgment)* [2009] ICJ Rep 213, 243 [66].

<sup>78</sup> *Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276 (1970) (Advisory Opinion)* [1971] ICJ Rep 16, 31 [53] (‘*Namibia*’).

<sup>79</sup> *Aegean Sea Continental Shelf (Greece v Turkey) (Judgment)* [1978] ICJ Rep 3, 32 [77].

<sup>80</sup> *Gabčíkovo–Nagymaros Project (Hungary v Slovakia) (Judgment)* [1997] ICJ Rep 7, 78 [140], 78 [142].

<sup>81</sup> *Pulp Mills on the River Uruguay (Argentina v Uruguay) (Judgment)* [2010] ICJ Rep 14, 83 [204].

<sup>82</sup> Richard Barnes, ‘The Continuing Vitality of UNCLOS’ in Jill Barrett and Richard Barnes (eds), *Law of the Sea: UNCLOS as a Living Treaty* (British Institute of International and Comparative Law, 2016) 459; Anna Petrig, ‘The Commission of Maritime Crimes with Unmanned Systems: An Interpretive Challenge for the United Nations Convention on the Law of the Sea’ in Malcolm D Evans and Sofia Galani (eds), *Maritime Security and the Law of the Sea: Help or Hindrance?* (Edward Elgar Publishing, 2020) 104.

<sup>83</sup> *UNCLOS* (n 2) Preamble para 1.

<sup>84</sup> *Ibid* Preamble para 3.

<sup>85</sup> *Ibid* Preamble para 7.

<sup>86</sup> *Third United Nations Conference on the Law of the Sea*, 185<sup>th</sup> plen mtg, UN Doc A/CONF.62/SR.185 (6 December 1982) 14 [52]. See also Shirley V Scott, ‘The LOS Convention as a Constitutional Regime for the Oceans’ in Alex G Oude Elferink (ed), *Stability and Change in the Law of the Sea: The Role of the LOS Convention* (Martinus Nijhoff Publishers, 2005) 9, 12.

<sup>87</sup> Tim Stephens, ‘Law of the Sea: UNCLOS as a Living Treaty.’ By Jill Barrett and Richard Barnes (Eds) (2016) 86 *British Yearbook of International Law* 225, 226. See also Barnes (n 82) 460–7; Jill Barrett, ‘The UN Convention on the Law of the Sea: A “Living” Treaty?’ in Jill Barrett and Richard Barnes (eds), *Law of the Sea: UNCLOS as a Living Treaty* (British Institute of International and Comparative Law, 2016) 3, 11–15; Petrig (n 82) 114.

to much smaller sailing vessels.<sup>88</sup> In addition, a cursory glance at the history of maritime technology shows that the drafters must have been aware that technological change would occur in shipbuilding, navigation and means of propulsion and that they would have intended that *UNCLOS* be able to accommodate these changes. Any definition of ‘ship’ in *UNCLOS* would have to encompass the range of possible vessels, with significant variation in construction methods, purposes and sizes.<sup>89</sup> Modern militaries are no exception and have a wide variety of ships, including high-speed patrol craft, troop transporters, submarines and aircraft carriers. Evidently, the more specific the requirements of the definition, the more problematic it will be to incorporate the definition into existing international law.

Most scholars who have considered the status of UUVs accept that at least some will be ships.<sup>90</sup> James Kraska, emphasising the importance of the freedom of the seas in the law of the sea, argues that we should take a flexible approach that is inclusive of UUVs.<sup>91</sup> Similarly, Robert McLaughlin argues that the flexibility of the general principles of the law of the sea mitigate the need to develop new, more comprehensive, regulation of UUVs at this stage. He says that the general law of the sea is adequate until we can better assess whether more detailed regulation is necessary once we have more information about the practical legal issues.<sup>92</sup>

There are indications that the international community accepts that the *UNCLOS* framework applies to some UUVs. The Maritime Safety Committee of the IMO has issued interim guidelines on the trial of ‘maritime autonomous surface ships’<sup>93</sup> as part of the development of a Regulatory Scoping Exercise to figure out how to address the operation of UUVs in IMO instruments.<sup>94</sup> In a survey of states completed by the Comité Maritime International that addressed the navigational rights of uncrewed vessels, no concerns were expressed about treating uncrewed devices as vessels or ships under the law of the sea.<sup>95</sup>

There is also some state practice, mainly relating to the US, supporting this approach.<sup>96</sup> The 2017 US Navy’s *The Commander’s Handbook on the Law of Naval Operations* (‘*Commander’s Handbook*’) refers to ‘unmanned vessels’ and says that these devices have ‘sovereign immunity’ as ships engaging in government non-commercial service.<sup>97</sup> Further, it says that the US ‘recognizes reciprocal full sovereign immunity privileges for the equivalent vessels of other

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<sup>88</sup> Noyes, ‘Interpreting the 1982 Law of the Sea Convention and Defining Its Terms’ (n 73) 56; Veal and Tsimplis (n 30) 314.

<sup>89</sup> Allen (n 29) 482.

<sup>90</sup> See, eg, McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 71) 233; Allen (n 29) 513; Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 63) 52; Daum (n 67) 85; Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 67) 122; Veal, Tsimplis and Serdy (n 6) 29.

<sup>91</sup> Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 63) 50.

<sup>92</sup> McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 71) 231.

<sup>93</sup> International Maritime Organization, *Interim Guidelines for MASS Trials*, IMO Doc MSC.1/Circ.1604 (14 June 2019) annex (‘*Interim Guidelines for MASS Trials*’).

<sup>94</sup> Robert Veal, ‘IMO Guidelines on MASS Trials: Interim Observations’ (2019) 19(8) *Lloyd’s Shipping and Trade Law* 1.

<sup>95</sup> Allen (n 29) 511.

<sup>96</sup> *Ibid* 509.

<sup>97</sup> *US Navy Commander’s Handbook* (n 10) 2-1 [2.1].

States'.<sup>98</sup> This appears to be in line with the approach taken to uncrewed aerial vehicles, which are treated by US doctrine as military aircraft, despite not having personnel on board.<sup>99</sup> Examining the customary law implications of US naval doctrine, Craig Allen did not find any objections from other states to this assertion and noted that it appears that the US maritime services have acted consistently with this position without protest for many years.<sup>100</sup>

Other military manuals are more ambiguous. The German *Law of Armed Conflict: Manual* states that UMVs 'can enjoy the sovereign immunity of government ships (including warships) provided that they cannot be classified as such themselves'.<sup>101</sup> While it is unclear, it could be read as meaning that UMVs can share the status of another government ship (presumably one they are deployed from) in the event that a UMV cannot be classified as a government ship in its own right. The *Military Manual on International Law Relevant to Danish Armed Forces in International Operations* ('Danish Military Manual') refers to 'unmanned underwater and surface vessels' when discussing what sort of devices can be used to maintain and enforce a naval blockade,<sup>102</sup> also perhaps suggesting that they can be ships. The *New Zealand Manual of Armed Forces Law* ('New Zealand Manual') addresses the status, rights and obligations of unmanned aerial systems (accepting that they can be military aircraft)<sup>103</sup> but does not address similar systems operating on or in the ocean.

Given the above, it seems safe to conclude that the term 'ship' is broad enough to refer to some UMVs.<sup>104</sup> In fact, it would be strange if the states party to *UNCLOS* only intended the Convention to apply to maritime devices already in existence; if they did, you would expect to see some effort to define 'ship' more narrowly.<sup>105</sup> Instead, by declining to define this term (or 'vessel'), the drafting of the Convention combined with its constitutional nature are evidence that an evolutionary approach is appropriate, allowing us to incorporate UMVs into the *UNCLOS* framework.<sup>106</sup> However, art 94(4) of *UNCLOS* might be an impediment to this conclusion.

## 2 The Impact of Article 94(4) of *UNCLOS* on the Concept of 'Ship'

Even if the generic concept of 'ship' includes UMVs, art 94(4) of *UNCLOS* might be a basis for arguing that an onboard master and crew are necessary. This provision sits within art 94, which sets out the duties of a flag state to 'effectively exercise its jurisdiction and control in administrative, technical and

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<sup>98</sup> Ibid 2-1 [2.1.1].

<sup>99</sup> Norris (n 9) 21; Department of Defense (US), *Use of International Airspace by US Military Aircraft and for Missile and Projectile Firings* (Instruction No 4540.01, 2 June 2015) 11.

<sup>100</sup> Allen (n 29) 510.

<sup>101</sup> Bundesministerium der Verteidigung, *Law of Armed Conflict: Manual* (Manual, 1 May 2013) 141 [1009].

<sup>102</sup> Danish Ministry of Defence, *Military Manual on International Law Relevant to Danish Armed Forces in International Operations* (Manual, September 2016) 597 ('Danish Military Manual').

<sup>103</sup> New Zealand Defence Force, *Manual of Armed Forces Law: Law of Armed Conflict* (Manual No DM 69 (2 ed) Vol 4, 2019) 10-32 [10.7.1]–[10.7.3] ('New Zealand Manual').

<sup>104</sup> See Veal, Tsimplis and Serdy (n 6) 27.

<sup>105</sup> Ibid.

<sup>106</sup> Ibid.

social matters'.<sup>107</sup> Article 94(3) provides that every flag state must take measures 'necessary to ensure safety at sea', including in relation to the 'manning of ships' and the 'training of crews'.<sup>108</sup> The requirements in para (4) further articulate the requirements of para (3) and are examples of measures deemed necessary to ensure safety at sea. Most importantly for our purposes, in the event that a device is recognised as a ship, sub-para (4)(b) requires that the flag state ensures that it is

in the charge of a master and officers who possess appropriate qualifications, in particular in seamanship, navigation, communications and marine engineering, and that the crew is appropriate in qualification and numbers for the type, size, machinery and equipment of the ship ...<sup>109</sup>

Finally, art 94(5) of *UNCLOS* provides that in establishing these measures, the flag state is required to 'conform to generally accepted international regulations, procedures and practices and to take any steps which may be necessary to secure their observance'.<sup>110</sup> In doing so, *UNCLOS* does not establish precise obligations for flag states but refers to an 'abstract, and continuously changing, set of international rules', thus allowing for technological change to be incorporated into the *UNCLOS* regime.<sup>111</sup>

Several scholars have suggested that art 94 is a significant impediment to categorising UUVs as 'ships' under *UNCLOS*, arguing that it requires flag states to ensure that there is a commander and crew on board every ship.<sup>112</sup> While the most obvious rationale for this requirement is to ensure the navigational safety of the ship, the designation of someone as a master is also important for the system of maritime liability,<sup>113</sup> and it serves an 'important security function', as coastal states have someone to hold criminally liable.<sup>114</sup>

There is no question that art 94 of *UNCLOS* was drafted with conventional ships, operated by a master, officers and crew, in mind.<sup>115</sup> However, the better view is that this provision does not define what can be a ship under *UNCLOS* but rather obliges states to only register ships that they are satisfied will meet certain safety criteria. The question of whether UUVs have access to the rights of ships under *UNCLOS* should be separated from the question of whether a specific device is able to comply with all of the safety requirements of *UNCLOS* set out in provisions like art 94.<sup>116</sup> It is up to the flag state to ensure that the UUV it is registering as a ship is compliant with *UNCLOS* obligations relating to safety, collision avoidance and protection of the environment.<sup>117</sup> If the flag state fails, it would be in breach of *UNCLOS*, but it would not change the status of the device

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<sup>107</sup> *UNCLOS* (n 2) art 94(1).

<sup>108</sup> *Ibid* art 94(3).

<sup>109</sup> *Ibid*.

<sup>110</sup> *Ibid* art 94(5).

<sup>111</sup> Veal and Ringbom (n 34) 103.

<sup>112</sup> de Zwart (n 8) 312; Norris (n 9) 26; Schmitt and Goddard (n 7) 576–7.

<sup>113</sup> Veal and Tsimplis (n 30) 317.

<sup>114</sup> *Ibid*.

<sup>115</sup> Van Hooydonk (n 17) 409.

<sup>116</sup> See Veal and Tsimplis (n 30) 314–34 for a detailed overview of the requirements that a UUV must meet under existing international law.

<sup>117</sup> *Ibid* 314–15.

as a ship.<sup>118</sup> This might seem like an unnecessary distinction, but it is important, as it constrains the remedies available to a state that discovers a flagged UMV in their territorial waters.

Besides, it is not clear that a flag state that registers a UMV as a ship would breach art 94 of *UNCLOS*. Article 94(4) is focused on the effective exercise of jurisdiction by the flag state and on ensuring the safety of ships. It should be enough to meet art 94 that the flag state is satisfied that the UMV has been designed and programmed to ensure ‘safety at sea’ and that there is a master and crew responsible for the safe navigation and communication of the device, regardless of whether they are physically on board the vessel and making every decision. This would be consistent with the system of regulation established by *UNCLOS*.

The most challenging requirement for a UMV will be satisfying the flag state that it is ‘in the charge of’ a master and crew. This requirement is not insurmountable, as the phrase ‘in the charge of’ does not necessarily connote physical presence. This is most easily seen where the ship is remotely controlled: while the person controlling the ship might not be on board, they are clearly commanding the vessel and could be designated as the ship’s master.<sup>119</sup> The situation is more difficult in moments when a UMV is operating autonomously. References to being in ‘command’ of a vessel could suggest contemporaneous influence.<sup>120</sup> While a person could be nominated as the master responsible for the vessel, and even if they could step in and remotely control the device at certain critical moments, it does seem distinct from the oversight that an onboard master or a remote controller has over the activities of the vessel when they are at the helm.<sup>121</sup> Nevertheless, as long as there is a person who is responsible, and the flag state is satisfied that this person has the requisite knowledge and access to the device to operate it safely (in the context of its capabilities and its purpose) and will be liable as master if there are any incidents, this should be enough to satisfy the requirement. Existing regulations do not require a master to be on the bridge navigating at all times even though they have responsibility the entire time.<sup>122</sup> Besides, some have questioned the credibility of these requirements given the number of ships operating under ‘less-than-strict flags of convenience’ that are still permitted access to the *UNCLOS* navigational regime.<sup>123</sup>

Other requirements of art 94 of *UNCLOS* are much easier to satisfy. The coastal state may be satisfied that the ‘appropriate’ number of crew on board the vessel is zero.<sup>124</sup> Further, the operator of the device will be subject to the same rules as the operators and commanders of other military devices as long as there is a traceable path of control over and responsibility for its deployment and recognition of the

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<sup>118</sup> Veal, Tsimplis and Serdy (n 6) 28.

<sup>119</sup> Ibid 36; Baughen (n 33) 131–2.

<sup>120</sup> Veal and Tsimplis (n 30) 318; Dean and Clack (n 14) 74.

<sup>121</sup> Van Hooydonk (n 17) 409–10.

<sup>122</sup> Veal and Tsimplis (n 30) 317.

<sup>123</sup> Van Hooydonk (n 17) 410.

<sup>124</sup> *UNCLOS* (n 2) art 94(4)(b); Veal and Tsimplis (n 30) 319–21.



scope for error or mistake.<sup>125</sup> This chain of reasoning is not unprecedented; it is effectively how US doctrine developed in relation to uncrewed aerial vehicles.<sup>126</sup>

The same is true of other provisions of *UNCLOS* that will, in effect, require UUVs to have certain capabilities to access certain rights. For example, to access innocent passage, an underwater UUV would have to be able to surface and turn off some of its surveying and information collecting functions.<sup>127</sup> None of the conditions imposed on innocent passage, or on the exercise of navigational rights, are dependent on people being on board the vessel and may be fulfilled by other technological solutions. Part of the reason that this is possible is because person-to-person interaction is not a required part of navigation; what is important is where and how the device is travelling through the ocean.

Evidently, some of the requirements of *UNCLOS* will be harder to comply with if there are no people on board, such as those of ensuring that the registration papers of the vessel are able to be inspected and enabling the UUV to communicate properly with other vessels. However, the purpose of these requirements could be presumably satisfied by ensuring that the documents are available online in an appropriate electronic form<sup>128</sup> and providing information on how to communicate with the ‘master’ responsible for the ship. Some rights are likely to be impossible for UUVs to access in the short term, such as a UUV boarding another vessel as part of an inspection.<sup>129</sup> Nevertheless, provided that there is a satisfactory technical solution found (which is no small thing), the presence of personnel on the vessel is not necessarily critical for the safety of other ships. These technical solutions may require additional regulations to clarify how the requirements of *UNCLOS* will be met for UUVs,<sup>130</sup> or at least require states to explain how they intend to satisfy them.

This begs the question of what the consequences are for a state that registers a UUV as a ship but, in doing so, fails to comply with the requirements of art 94 of *UNCLOS* (even if the above workarounds for UUVs were accepted). At the very least, disputes between states about whether the registration of a ship is consistent with the art 94 requirements should be expected. This could result in coastal states attempting to regulate or interfere with some of the activities of a UUV, not on the grounds of the device not being a ship but because it fails to satisfy generally accepted international rules relating to navigational safety. Article 21 allows coastal states to protect, inter alia, the safety of maritime traffic and the marine environment by regulating innocent passage, as long as the regulation is in conformity with the provisions of *UNCLOS* and ‘other rules of international law’.<sup>131</sup> Importantly, art 21(2) provides that laws are not permitted to apply to the

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<sup>125</sup> McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 71) 233. The precise scope of what amounts to ‘control’ is worthy of further consideration. It could be exercised in different ways at different stages of the lifecycle of the device: during the design process, as part of technical implementation, during operations and even in post-operation analysis.

<sup>126</sup> Norris (n 9) 26–7, 29.

<sup>127</sup> See *UNCLOS* (n 2) art 19.

<sup>128</sup> Van Hooydonk (n 17) 415.

<sup>129</sup> Klein (n 67) 256–7.

<sup>130</sup> Van Hooydonk (n 17) 415.

<sup>131</sup> *UNCLOS* (n 2) art 21.

‘design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted international rules or standards’.<sup>132</sup>

While Robert Veal and Michael Tsimplis found that most of the generally accepted rules of international law will be able to be met by a UMV,<sup>133</sup> they identified at least one critical obligation that could pose an insurmountable hurdle for autonomous devices. Rule 2 of *COLREGs*<sup>134</sup> — which applies to military vessels as well as civilian vessels — prioritises ‘good seamanship’ over strict compliance with *COLREGs*.<sup>135</sup> There may be situations where good seamanship, and thus *COLREGs*, requires a departure from the rules.<sup>136</sup> Veal and Tsimplis query whether an autonomous system could determine when deviation from the rules is necessary, as this is a ‘cognitive process of high sophistication, reliant, in particular, on nautical expertise and experience’.<sup>137</sup> While their concerns are warranted, fulfilling the requirements of good seamanship under *COLREGs* seems much more attainable than other judgments that autonomous systems could be tasked with. To give one example, equipping an autonomous weapon with the contextual judgment necessary to assess whether an attack that would result in the death of a civilian was ‘proportionate’ to the military advantage expected to be gained, as required by international humanitarian law, would be a formidable ethical and technical challenge. In contrast, the goal of *COLREGs* is clear: to avoid collisions and, if a collision is unavoidable, to make a navigational decision that causes less damage and avoids the loss of life.<sup>138</sup> As Veal and Tsimplis recognise, this is a similar challenge to the development and safe use of driverless cars.<sup>139</sup> A technological solution might be some years away, but it does not seem impossible.

The enforcement options available to a coastal state where a ship (including a UMV) fails to comply with the legitimate rules imposed by the coastal state on innocent passage under art 21 of *UNCLOS* are unclear. It would depend in part on whether the breaches of the rules meant that the passage was ‘not innocent’: if the design of the UMV was in breach of art 19(2) — such as by not switching off intelligence gathering equipment — art 25(1) allows coastal states to take ‘the necessary steps’ to prevent the passage.<sup>140</sup> This could include stopping and inspecting the UMV, diverting it from the territorial sea or detaining the ship and forcing it into a coastal port to institute legal proceedings.<sup>141</sup> However, breaching a coastal state requirement purporting to require a master to be on board the UMV would not necessarily make the passage not innocent.<sup>142</sup> Outside of breaches of coastal state regulation relating to pollution, *UNCLOS* appears to be limited about

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<sup>132</sup> Ibid art 21(2).

<sup>133</sup> Veal and Tsimplis (n 30) 314–30. See also Dean and Clack (n 14) 74–84 for a useful overview of some of the problems that U MVs would have in complying with international regulations relating to commercial shipping.

<sup>134</sup> *COLREGs* (n 52) r 2.

<sup>135</sup> Veal and Tsimplis (n 30) 324.

<sup>136</sup> Ibid 324–5.

<sup>137</sup> Ibid 325. A similar point is made in Baughen (n 33) 134; Veal and Ringbom (n 34) 110–11.

<sup>138</sup> Veal and Tsimplis (n 30) 325–6.

<sup>139</sup> Ibid 326.

<sup>140</sup> *UNCLOS* (n 2) arts 19(2), 25(1).

<sup>141</sup> Kari Hakapää, ‘Innocent Passage’ in Rüdiger Wolfrum (ed), *Max Planck Encyclopedia of Public International Law* (Oxford University Press, online at May 2013) [19]; Tanaka (n 39) 544.

<sup>142</sup> Tanaka (n 39) 543.

what options are available to a coastal state in the event of non-compliance with their art 21(1) passage regulations.<sup>143</sup> In this case, art 31 provides that the flag state is internationally responsible for any loss or damage to the coastal state resulting from the non-compliance by a government ship with the laws and regulations of the coastal state concerning passage through the territorial sea.<sup>144</sup>

### 3 *The Search for a Single Definition of 'Ship' in UNCLOS*

It is all very well to conclude that at least some UUVs will be able to be categorised as a 'ship'. But will there be some that will not? How can we distinguish ships from other sorts of maritime devices? As set out above, the term 'ship' is generic. The preparatory documents to *UNCLOS* do not assist with clarifying the meaning of the term or establishing the boundaries of the category.<sup>145</sup>

Other treaties and conventions have definitions of 'ship' (or 'vessel') that might provide an indication of how we might distinguish them from other maritime devices.<sup>146</sup> Importantly, most do not regard having a crew or commander on board the vessel as an essential part of being a ship.<sup>147</sup> To give two prominent examples, 'vessel' is defined in the *COLREGs* as 'every description of water craft, including non-displacement craft, WIG craft and seaplanes, used or capable of being used as a means of transportation on water'.<sup>148</sup> The *International Convention for the Prevention of Pollution from Ships (MARPOL)* defines a 'ship' as 'a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, floating craft and fixed or floating platforms'.<sup>149</sup> This definition, like some from other treaties, will cover some UUVs.<sup>150</sup> While national maritime laws might also be used to provide a definition of 'ship' or 'vessel', they also use a variety of factors to differentiate between ships and other devices.<sup>151</sup> Some national laws define 'ships' and 'vessels' on the basis of whether they can be used as a method of transportation, while others adopt a more general definition based on whether they be used in maritime navigation, their flotation capacity or their size.<sup>152</sup>

While the more precise definitions are clearer, they should not be used to determine what marine devices can be deemed 'ships' for the purpose of the navigational rights in *UNCLOS*. These definitions are often designed specifically

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<sup>143</sup> Hakapää (n 141) [20].

<sup>144</sup> *UNCLOS* (n 2) art 31.

<sup>145</sup> Veal, Tsimplis and Serdy (n 6) 26.

<sup>146</sup> For a concise overview of the different definitions provided by international public and private law treaties, see Van Hooydonk (n 17) 406–8.

<sup>147</sup> *Ibid* 409.

<sup>148</sup> *COLREGs* (n 52) r 3(a), as amended by Assembly, International Maritime Organization, *Amendments to the International Regulations for Preventing Collisions at Sea, 1972*, Res A.910(22), 22<sup>nd</sup> sess, Agenda Item 14, IMO Doc A 22/Res.910 (22 January 2002, adopted 29 November 2001) annex ('Amendments to the International Regulations for Preventing Collisions at Sea, 1972') para 1.

<sup>149</sup> *International Convention for the Prevention of Pollution from Ships*, opened for signature 15 January 1974, 1340 UNTS 184 (entered into force 2 October 1983) art 2(4) ('*MARPOL*').

<sup>150</sup> Allen (n 29) 481–2. See also Leonida Giunta, 'The Enigmatic Juridical Regime of Unmanned Maritime Systems' (Conference Paper, Oceans '15 MTS/IEEE Genova, May 2015) 6.

<sup>151</sup> Van Hooydonk (n 17) 408.

<sup>152</sup> *Ibid*. See also Veal and Tsimplis (n 30) 308–12; Dean and Clack (n 14) 70–2.

to address the purposes of the specific convention<sup>153</sup> or domestic legislation. The variety of definitions make it necessary to consider the specific treaty to determine whether it applies to UMVs.<sup>154</sup> Any specific definition of ‘ship’ or ‘vessel’ provided by a treaty would apply in the context of that treaty, and this may operate to exclude UMVs from that treaty but not necessarily from others. The same is true for existing ships and vessels, which due to size or purpose may not be bound by all treaties on the law of the sea. Besides, given that most of these other treaties specifically exclude state vessels being operated for non-commercial purposes, they are of limited significance in the military context.<sup>155</sup> These more restrictive definitions that limit the application of a convention to a specific category of ‘ship’ do show that states have been willing to demarcate clearly what maritime devices are bound by some treaties, suggesting that the lack of express wording in *UNCLOS* was designed to promote a more open approach.<sup>156</sup>

The lack of clarity has led some to propose a definition of ‘ship’ that relies on some essential function of the device. For example, Oliver Daum considers a range of international treaties and argues that a ‘ship’ must have ‘transportation feature[s]’.<sup>157</sup> He is quite restrictive about what it means to engage in transportation, finding that the ship ‘must be destined or able to convey certain items from one port or place to another port or place’,<sup>158</sup> such as transporting weapons from one location to another.<sup>159</sup> He draws a distinction between carrying weapons (which he categorises as external to the device) and carrying sensors (which he says are part of the device), determining that only the former satisfies the transportation requirement.<sup>160</sup> This means that he finds that if a UMV is not undertaking a ‘transportation mission, meaning to transport goods, people, weapons or other items from port to port’, it ceases to be a ship.<sup>161</sup> Daum’s distinction between carrying weapons and carrying sensors is hard to accept: both can be essential to the purpose of a military ship. It would also be a strange outcome if a maritime device were to be switching in and out of such a basic category of the law of the sea, and this would increase ambiguity and confusion about what rights and obligations a UMV has at any moment in time.

Similarly, Allen sets out to find a definition by assessing ‘the sum of each of the specialized, restricted definitions’ in international law, searching for something broad enough to include all the references to ‘ship’ or ‘vessel’ in *UNCLOS*.<sup>162</sup> He proposes the definition from US domestic law that a ship is every ‘artificial contrivance used or capable of being used as a means of transportation on the water’.<sup>163</sup> This definition does not require an onboard crew but, like the definition proposed by Daum, leaves open the question of what exactly needs to

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<sup>153</sup> Veal, Tsimplis and Serdy (n 6) 26; Schmitt and Goddard (n 7) 577; Van Hooydonk (n 17) 406–7.

<sup>154</sup> Allen (n 29) 494.

<sup>155</sup> See, eg, *SOLAS* (n 51) reg 3(a)(i); *MARPOL* (n 149) art 3(3).

<sup>156</sup> Veal, Tsimplis and Serdy (n 6) 26–8.

<sup>157</sup> Daum (n 67) 80.

<sup>158</sup> *Ibid* 82.

<sup>159</sup> *Ibid* 83–4.

<sup>160</sup> *Ibid*.

<sup>161</sup> *Ibid* 84.

<sup>162</sup> Allen (n 29) 494.

<sup>163</sup> *Ibid*, quoting 1 USC § 3 (1947).

be transported. Allen suggests that this would not have to be passengers or cargo (as no one disputes that warships are ships, and they carry neither).<sup>164</sup> He argues:

If it is assumed that the transportation requirement refers to the carriage of something that has a functional value other than the watercraft itself, that functional definition would include watercraft that carry (ie, transport) sensors and other equipment that enhance or extend the user's capabilities and for which navigation rights are essential to its function.<sup>165</sup>

The American Branch of the International Law Association decided against recommending a requirement for a transportation function, instead defining 'ship' as any 'human-made device, including a submersible vessel, capable of traversing the sea'.<sup>166</sup> Andrew Norris, who supports this definition, observes that this definition provides that the essence of a vessel is that it can move through water.<sup>167</sup> Allen argues this definition may be too broad, as it could include torpedoes and smart mines, devices that he considers clearly outside of the category.<sup>168</sup>

Several sources argue that a single definition for 'ship' in *UNCLOS* is inappropriate and that it depends on the specific provision being considered. This is effectively the approach of the leading commentary on *UNCLOS*, which proposes that, as 'ship' is not defined, its 'precise significance will depend on the circumstances and the context' in which it appears.<sup>169</sup> Similarly, John Noyes observes that 'the legal contexts in which the word "ship" is used vary so significantly that it may be inappropriate to specify one definition'.<sup>170</sup> He says the difficulties occur at the margins, asking whether we should include

floating platforms or drilling rigs (with or without engines), temporarily fixed platforms, hydrofoils, seaplanes on the water, amphibious craft, submersibles, very small boats, houseboats or docked hotels like *Queen Elizabeth I*, boats towed for repairs, abandoned craft, wrecks (capable of being raised or not), craft in drydock for repair or safekeeping, craft under construction (launched or yet to be launched) ...<sup>171</sup>

For Noyes, including all of these devices in the category of 'ship' for all purposes causes difficulties. Expanding on this point and using the example of fixed platforms, he argues that, while it makes sense to apply the rules related to the duty to rescue or serious marine pollution to these devices, it would be a 'nonsense' to apply the right of hot pursuit (art 111 of *UNCLOS*).<sup>172</sup> Instead, he says we should be comfortable with different definitions of 'ship' for different settings.<sup>173</sup> He uses art 91 of *UNCLOS* to demonstrate his preferred approach. Article 91(2) requires that '[e]very State ... issue to ships to which it has granted

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<sup>164</sup> Allen (n 29) 496.

<sup>165</sup> Ibid.

<sup>166</sup> Noyes, 'Interpreting the 1982 Law of the Sea Convention and Defining Its Terms' (n 73) 56, 59, 61; George K Walker, *Definitions for the Law of the Sea: Terms Not Defined by the 1982 Convention* (Martinus Nijhoff Publishers, 2012) 300–1.

<sup>167</sup> Kraska, 'The Law of Unmanned Naval Systems in War and Peace' (n 63) 53.

<sup>168</sup> Allen (n 29) 495.

<sup>169</sup> Nandan and Rosenne (n 4) 46.

<sup>170</sup> Noyes, 'Interpreting the 1982 Law of the Sea Convention and Defining Its Terms' (n 73) 55.

<sup>171</sup> Ibid 57.

<sup>172</sup> Ibid.

<sup>173</sup> Ibid 58.

the right to fly its flag documents to that effect',<sup>174</sup> which he suggests should be read as excluding smaller vessels (given that not all states issue documents to small boats).<sup>175</sup> In contrast, he says there is 'no reason' to exclude smaller vessels from the requirements of art 91(1), under which each state must 'fix the conditions for the grant of its nationality to ships' and there must be 'a genuine link' between the state and the ship.<sup>176</sup> Noyes argues that a restrictive definition of 'ship' should be preferred where required by the context, and a broad meaning where the context connotes a wide choice.<sup>177</sup> Anna Petrig makes a similar point, arguing that the definition of 'ship' differs from rule to rule and the subject matter and context, and that 'a single definition is neither possible nor helpful'.<sup>178</sup>

There are advantages to this approach. Deciding that *all* U MVs *must* be ships would cause difficulties given the broad range of devices that could fall into this category and the diverse contexts in which they would be regulated.<sup>179</sup> Instead, some have proposed that we should examine a range of factors, such as appearance, size, the mission it has been tasked with and, in the U MV context, the degree of autonomous operation, on a case-by-case basis.<sup>180</sup> However, it is not an approach that reduces the risk of conflict between states, as the weight given to each factor might differ from state to state. It would be better for the preferred interpretation to offer a more certain outcome to such a fundamental question.

Some deny that there is a need for any definition at all. Veal, Tsimplis and Andrew Serdy argue that the lack of a definition in *UNCLOS* means that what constitutes a ship is left to individual states to determine by national law.<sup>181</sup> They find support for their argument in art 91 of *UNCLOS*, which provides that flag states shall 'fix the conditions for the grant of its nationality to ships', potentially leaving it to states to determine whether the 'conditions' will be met by a maritime device, even if it has no people on board.<sup>182</sup> This conclusion leads them to argue that once the flag state has determined that the status of a craft is a ship and has access to the navigational rights, this must be accepted by other states.<sup>183</sup> In a separate article, Veal and Tsimplis explain that, thus, 'there really is no *international* definition of "ship", only an international mechanism for determining this question'.<sup>184</sup>

This approach risks giving too much ground to states to determine what amounts to a ship and allowing for too much flexibility: the navigational rights in the law of the sea are only relevant to devices travelling on or in the ocean. It would not make sense, for example, to give an aerial vehicle the status of a ship so that it could access navigational rights (not to mention that the rights would not apply to the device, as it could not comply with the rules). The better way of conceptualising the discretion available to states is not that they can deem anything

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<sup>174</sup> *UNCLOS* (n 2) art 91(2).

<sup>175</sup> Noyes, 'Interpreting the 1982 Law of the Sea Convention and Defining Its Terms' (n 73) 58.

<sup>176</sup> *Ibid* 59; *UNCLOS* (n 2) art 91(1).

<sup>177</sup> Noyes, 'Interpreting the 1982 Law of the Sea Convention and Defining Its Terms' (n 73) 61.

<sup>178</sup> Petrig (n 82) 126. This is also the view of Natalie Klein: Klein (n 67) 251.

<sup>179</sup> Veal, Tsimplis and Serdy (n 6) 25; Norris (n 9) 25–6.

<sup>180</sup> Norris (n 9) 25–6; Klein (n 67) 251.

<sup>181</sup> Veal, Tsimplis and Serdy (n 6) 28. See also Veal and Tsimplis (n 30) 309.

<sup>182</sup> Veal, Tsimplis and Serdy (n 6) 27.

<sup>183</sup> *Ibid* 28.

<sup>184</sup> Veal and Tsimplis (n 30) 309.

a ship but rather that they are able to determine what devices with some connection with the sea they want to categorise as ‘ships’, recognising that doing so will oblige the state to ensure those devices comply with the *UNCLOS* rules.

This is the approach of René-Jean Dupuy and Daniel Vignes, who observed that

it would seem that ‘ship’/‘vessel’ may be taken to mean any object or device found in the seas and connected to a State by a link such that that State can claim to exclude interference by other States. Such a link is provided by the flying of a flag, for example, but also by the fact of registration in the case of seaplanes, and even situations of actual control such as those which may exist in the case of platforms and other installations. Thus, the concept may take on a different hue according to the zone of the sea concerned by reason of the acknowledged rights of the State to which the ‘ship’/‘vessel’ belongs.<sup>185</sup>

This is a sensible way to approach the problem. Aside from requiring the object or device to be ‘found in the sea’, the crucial element is the link to the state, allowing it to claim some sort of sovereignty over the device. Being flagged by a state, and thereby being recognised as a ‘ship’, is the crucial criteria for accessing the navigational rights provided by *UNCLOS*.<sup>186</sup> This approach — which is very broad — would evidently be broad enough to encompass UMVs if they are recognised and flagged as ships by states. There may be provisions of *UNCLOS* that apply differently in light of the size and capacity of the UMV, but this is no different to how they would be applied to any other ship.

### C *Will They Be a Separate Entity for Navigational Purposes?*

Maritime devices can be deployed by ships to assist in navigation and security, some of which will be treated by the law of the sea as part of the ship (and sharing its status).<sup>187</sup> Clearly, UMVs might be the sort of device that is used in this way. This raises the question of when UMVs deployed by government ships (including warships) will be considered independent entities and when they will be merely components of their deploying platform.<sup>188</sup> While this sort of technology has been used by navies for many years (such as wave gliders deployed in maritime survey and surveillance),<sup>189</sup> it is becoming more sophisticated. For example, the US Navy is developing surface drones that could be incorporated into the perimeter security systems of warships and used as part of ‘layered ship defenses’.<sup>190</sup> Such devices may well be better seen as a system of a ship and treated by the law as being part of the same entity.

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<sup>185</sup> René-Jean Dupuy and Daniel Vignes, *A Handbook on the New Law of the Sea* (Martinus Nijhoff Publishers, 1991) vol 2, 842.

<sup>186</sup> Van Hooydonk (n 17) 409.

<sup>187</sup> Norris (n 9) 23; McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 71) 238.

<sup>188</sup> Norris (n 9) 23; McLaughlin, ‘Unmanned Naval Vehicles at Sea’ (n 71) 109–10.

<sup>189</sup> See Bork et al (n 21).

<sup>190</sup> Kris Osborn, ‘The US Navy Has Big Plans to Use Deadly “Swarms”. Here’s How It Works’, *The National Interest* (Blog Post, 4 February 2019) <<https://nationalinterest.org/blog/buzz/us-navy-has-big-plans-use-deadly-swarms-heres-how-it-works-43277>>, archived at <<https://perma.cc/NFH9-TVJL>>.

Consistent with the above discussion on whether UUVs are ships, the best view is that as long as the device has some connection with the ocean, the critical factor for navigational rights is how the device is categorised by the flag state. This will not necessarily be determined by the categorisation of the launching vessel. US doctrine states that UUVs have independent status for the purposes of navigation and are not dependent on the status of the launch platform,<sup>191</sup> and that they can be deployed by larger vessels ‘as long as their employment complies with the [applicable] navigational regime’.<sup>192</sup> Norris interprets this ambiguous statement as meaning that a UUV can be deployed by a larger vessel as long as the deployment is consistent with the navigational regime that applies to the larger vessel at the time of deployment.<sup>193</sup> A failure to comply with these requirements may mean that the deploying unit faces consequences.<sup>194</sup> However, once a UUV is deployed, it has an independent entitlement to exercise navigational rights.<sup>195</sup> This is a sensible way to read the statements from US doctrine and is consistent with the ways that other vessels, ships or aircraft that can be deployed from ships are treated. The approach proposed by Veal, Tsimplis and Serdy is also consistent with this: they argue that while a launching platform will not determine the status of the device (given the wide range of ways the devices could be deployed), responsibility for the operation of the device may still be linked to the platform.<sup>196</sup>

An emerging and linked categorisation challenge is how to classify a swarm of small devices acting in concert but separately from a warship. There are reports that this technology, which has apparently already been used to carry out attacks, can be used to overwhelm conventional defences of warships and other military systems.<sup>197</sup> In this case, the swarm could be classified as many devices or a single naval system. It may not be possible to identify a ‘parent’ device that has a status that the other devices share. Depending on how the swarm operates, this could be important. If some of the vessels that are part of the swarm do not travel continuously and expeditiously, but instead follow some other path set by the algorithms of the system, they might fall foul of the rules of innocent and transit passage if assessed as a single device. However, if the swarm is categorised as a single system, the passage through the relevant area might be clearly continuous and expeditious and not in breach of the rules of transit passage. Melissa de Zwart argues that the ‘possibility of a networked fleet’ means we should consider a consistent characterisation of UUVs, and that the most prudent approach is to characterise the device in accordance with its function and operation and to attribute control to the human operator, even if they are very remote from the UUV.<sup>198</sup>

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<sup>191</sup> *US Navy Commander’s Handbook* (n 10) 2-4 [2.3.6].

<sup>192</sup> *Ibid* 2-6 [2.5.2.5]; Norris (n 9) 23.

<sup>193</sup> Norris (n 9) 23-4.

<sup>194</sup> *Ibid*.

<sup>195</sup> *Ibid* 24.

<sup>196</sup> Veal, Tsimplis and Serdy (n 6) 30. See also de Zwart (n 8) 311.

<sup>197</sup> David Pinion, ‘The Navy and Marine Corps Need to Prepare for the Swarm of the Future’, *War on the Rocks* (Commentary, 28 March 2018) <<https://warontherocks.com/2018/03/the-navy-and-marine-corps-must-plan-for-the-swarm-of-the-future/>>, archived at <<https://perma.cc/8VGJ-RVED>>.

<sup>198</sup> de Zwart (n 8) 311.



## IV WHEN IS A VESSEL A WARSHIP?

While it seems safe to conclude that UMVs can be ships that have access to navigational rights under *UNCLOS*, it is not at all clear that they will be able to be classified as ‘warships’. Warships — which are a subset of ships and vessels — are generally understood to be the only vessels that can exercise belligerent rights.<sup>199</sup> This means that they have the exclusive right to conduct offensive attacks, with other vessels limited to providing support during armed conflict. Warships can be contrasted with naval auxiliaries, ships that assist naval forces, which are targetable under international humanitarian law and can be crewed by civilians. Naval auxiliaries are generally understood to be unable to exercise belligerent rights.<sup>200</sup> This means that the strategic and tactical value of UMVs would be significantly limited if they are treated only as ships and not warships.<sup>201</sup>

A ‘warship’ is explicitly defined in art 29 of *UNCLOS* as

a ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the State and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline.<sup>202</sup>

It would be straightforward for a UMV to meet some of the requirements of this definition. The UMVs considered in this article will belong to the armed forces of a state, and a device could easily be given external marks.<sup>203</sup> However, it is much less clear whether a UMV could be ‘under the command’ of an officer and ‘manned by a crew’.

It might seem that this is a similar situation to the impact of art 94 of *UNCLOS* on the category of ‘ship’ and that it could be argued that, rather than limiting the definition of warships, art 29 just obliges states to ensure that their warships have these features. However, this is not the case: the requirement for warships to be ‘under the command’ of an officer and ‘manned by a crew’ is specifically part of the definition of ‘warship’ in art 29. Satisfying these criteria is a threshold requirement for being classified as a ‘warship’. In contrast, art 94 places an obligation on states to ensure that the devices they register as ships meet certain safety requirements. The designation of a device as a ‘ship’ precedes the application of art 94.

Before turning to consider how flexible (or not) the definition of ‘warship’ might be, it is important to understand the historical context of the distinction between warships and other naval vessels and what this reveals about the object

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<sup>199</sup> Norris (n 9) 58–9; Wolff Heintschel von Heinegg, ‘Warships’ in Rüdiger Wolfrum (ed), *Max Planck Encyclopaedia of Public International Law* (Oxford University Press, online at October 2015) [51]; *Danish Military Manual* (n 102) 584; *New Zealand Manual* (n 103) 10–4 [10.2.5]; *Manual i krigens folkerett* (Manual, 2013) 200 [10.19] [*Manual of the Law of Armed Conflict* (Manual, 2018) 220–1 [10.19] (‘*Norwegian Manual*’)]; *US Navy Commander’s Handbook* (n 10) 2-1–2-2 [2.2.1]; Department of Defense (US), *Law of War Manual* (Manual, December 2016) 887 [13.3.3].

<sup>200</sup> Heintschel von Heinegg, ‘Warships’ (n 199) [51]; *Norwegian Manual* (n 199) 221 [10.22]; *US Navy Commander’s Handbook* (n 10) 2-2 [2.2.1]; Department of Defense (US), *Law of War Manual* (n 199) 887 [13.3.3].

<sup>201</sup> Nasu and Letts (n 21) 86.

<sup>202</sup> *UNCLOS* (n 2) art 29.

<sup>203</sup> McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 71) 239.

and purpose of art 29 of *UNCLOS*. This category of ‘warship’ emerged in international law in the 19<sup>th</sup> century to distinguish state vessels (warships) from the vessels of privateers — private individuals that were given permission by belligerents, via a letter of marque or other means, to campaign against enemy shipping.<sup>204</sup> The prohibition on privateering can be traced to the *Declaration Respecting Maritime Law* of 1856, agreed as part of the *General Treaty for the Re-Establishment of Peace* (commonly known as the *Treaty of Paris*) ending the Crimean War.<sup>205</sup> The banning of this practice restricted belligerent activities to the military ships of the states in conflict, a rule that now has customary law status.<sup>206</sup>

The prohibition on privateering was solidified by the adoption of the specific criteria to distinguish warships from other vessels in the 1907 *Convention Relative to the Conversion of Merchant-Ships into War-Ships*.<sup>207</sup> Articles 1 to 4 of this Convention established that in order to be converted to a warship, a merchant vessel had to be ‘placed under the direct authority, immediate control, and responsibility’ of the flag state, bear the ‘external marks which distinguish the warships of their nationality’, be commanded by an officer of the ‘fighting fleet’ and be crewed by people subject to military discipline.<sup>208</sup> These requirements were incorporated into art 8(2) of the 1958 *Convention on the High Seas* with some minor amendments, most significantly that the category was limited to vessels that were part of the ‘naval forces’, commanded by an officer on the ‘Navy List’ and ‘manned’ by people subject to ‘naval discipline’.<sup>209</sup> This limitation to naval forces was adjusted in *UNCLOS* to reflect that military ships are not exclusively operated by navies.<sup>210</sup> Depending on the structure of the armed forces in the relevant state, the *UNCLOS* definition is wide enough to cover services like the coast guard and frontier police.<sup>211</sup> The development of the definition of ‘warships’ as an effort to outlaw privateering makes clear that the parts of the definition in relation to command and crewing were about ensuring that a warship was not a private vessel. The purpose of the law was to limit certain belligerent naval activities to state ships,<sup>212</sup> not to prevent UMVs from being used for military purposes.<sup>213</sup> There is no suggestion that this purpose was reconsidered during the negotiations of *UNCLOS* in the 1980s. Given this, the *VCLT* requires us to have regard to this purpose when assessing how literal the interpretation of the *UNCLOS* requirement should be.<sup>214</sup>

Regardless, applying this to determine what being ‘under the command of an officer’ and ‘manned by a crew’ mean appears straightforward: this seems to

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<sup>204</sup> Heintschel von Heinegg, ‘Warships’ (n 199) [3].

<sup>205</sup> Norris (n 9) 57; Heintschel von Heinegg, ‘Warships’ (n 199) [3]. For more, see Jan Martin Lemnitzer, *Power, Law and the End of Privateering* (Palgrave Macmillan, 2014).

<sup>206</sup> Norris (n 9) 57.

<sup>207</sup> *Convention Relative to the Conversion of Merchant-Ships into War-Ships*, opened for signature 18 October 1907, 205 ConTS 319 (entered into force 26 January 1910).

<sup>208</sup> *Ibid* arts 1–4.

<sup>209</sup> *Convention on the High Seas*, opened for signature 29 April 1958, 450 UNTS 11 (entered into force 30 September 1962) art 8(2).

<sup>210</sup> Heintschel von Heinegg, ‘Warships’ (n 199) [5].

<sup>211</sup> Nandan and Rosenne (n 4) 252.

<sup>212</sup> Heintschel von Heinegg, ‘Warships’ (n 199) [16].

<sup>213</sup> Nasu and Letts (n 21) 85.

<sup>214</sup> *Vienna Convention on the Law of Treaties*, opened for signature 23 May 1969, 1155 UNTS 331 (entered into force 27 January 1980) art 31(1).

require the presence of a military officer and crew on the vessel.<sup>215</sup> This appears to be the approach that states are currently taking regarding UUVs. The US Navy's 2017 *The Commander's Handbook on the Law of Naval Operations* describes the definition of 'warship' in a way that suggests that UUVs would not fall into that category. The handbook does not include UUVs in the section on warships,<sup>216</sup> but rather deals with them in a separate section addressing 'Other Naval Craft'.<sup>217</sup> Similarly, the *Danish Military Manual* defines warships according to the *UNCLOS* definition (requiring that they be under the command of an officer and with a crew under armed forces discipline) without any suggestion that an uncrewed device could meet the requirements.<sup>218</sup> The Norwegian *Manual of the Law of Armed Conflict* repeats the requirements of warships from *UNCLOS* without further comment.<sup>219</sup> While the *New Zealand Manual* accepts that the 'crewing' requirement for military aircraft can be met by a device being pre-programmed by military personnel, its definition of 'warship' requires that it be crewed 'by personnel'.<sup>220</sup>

Similarly, McLaughlin says that while being under the 'command of an officer' might allow for remote command, 'when read together with the requirement ... to be "manned" by a crew subject to regular armed forces discipline, this degree of elasticity can be doubted'.<sup>221</sup> He explains:

In a purely practical sense, it is difficult to see how 'manned' could be stretched to include remote management and control, unless there is a (questionable) assertion that the unmanned surface vehicle or unmanned underwater vehicle is not the entirety of the entity in question, and its full physical manifestation includes the controls and controller sitting ashore.<sup>222</sup>

Veal, Tsimplis and Serdy reach the same conclusion,<sup>223</sup> although they do suggest that a more flexible approach might be appropriate given the increasing use of remotely controlled drones and other devices.<sup>224</sup> They explain:

One approach may be to apply a liberal interpretation to manning so as to include remote control and pre-programming. This seems in keeping with the technological reality, particularly to the extent that remote control gives the shore-based controller real-time control over the UUV, operating at the surface, comparable to a manned equivalent.<sup>225</sup>

They are less willing, however, to extend the definition to allow for pre-programmed autonomous operations to satisfy the command and crewing requirements, saying that this would stretch 'the unambiguous wording of Article 29 too far'.<sup>226</sup>

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<sup>215</sup> *UNCLOS* (n 2) art 29; Schmitt and Goddard (n 7) 579.

<sup>216</sup> *US Navy Commander's Handbook* (n 10) 2-1-2-2 [2.2].

<sup>217</sup> *Ibid* 2-3-2-4 [2.3].

<sup>218</sup> *Danish Military Manual* (n 102) 635.

<sup>219</sup> *Norwegian Manual* (n 199) 220.

<sup>220</sup> *New Zealand Manual* (n 103) 10-4 [10.2.3], 10-4 [10.2.5].

<sup>221</sup> McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 71) 239.

<sup>222</sup> *Ibid*.

<sup>223</sup> Veal, Tsimplis and Serdy (n 6) 30.

<sup>224</sup> *Ibid* 30-1.

<sup>225</sup> *Ibid*.

<sup>226</sup> *Ibid* 31; Schmitt and Goddard (n 7) 579.

Other scholars are more permissive. Heintschel von Heinegg focuses on the purpose of the regulation, saying that, as it is to limit belligerent rights to the regular armed forces of the flag state, ‘unmanned seagoing vehicles could be considered warships if the persons remotely operating or controlling them are subjected to regular armed forces discipline’.<sup>227</sup> Norris says that ‘[a]t first glance’, it appears that a UMV could never qualify as a warship because it does not have a crew, but he points to the legal treatment of uncrewed aerial vehicles to show how the difficult components of the definition might be dealt with.<sup>228</sup> Norris refers to the examination of the definition of ‘military aircraft’ in the *HPCR Manual on International Law Applicable to Air and Missile Warfare*,<sup>229</sup> the commentary to which reveals that the experts involved in the manual’s development decided that the physical location of the commander was not critical; what was important was that a member of the armed forces exercised control over the aircraft.<sup>230</sup> Similarly, they were not convinced that the ‘crew’ would need to actually be on board the craft. It was enough that the programming was executed by members of the military.<sup>231</sup> Norris suggests that the same interpretive manoeuvres would be possible with UMVs, allowing for classification as warships.<sup>232</sup>

Petrig identifies a similar problem for the application of the definition of ‘piracy’ in art 101(a) of *UNCLOS* to UMVs.<sup>233</sup> Article 101(a) provides that piracy consists of illegal acts of violence, detention or depredation ‘committed for private ends by the crew or the passengers of a private ship’.<sup>234</sup> Petrig observes that it could be argued that ‘crew’ — a ‘generic term that can be interpreted in light of present-day conditions’ — could be interpreted widely to cover people operating the device remotely.<sup>235</sup> However, she says that the provision’s role in providing a definition for criminal activity means that a stricter interpretive approach, paying greater regard to the principle of legality, should probably be preferred.<sup>236</sup>

In the event of an armed conflict involving highly advanced navies, it seems likely that at least some states will take a similar approach and grant UMVs warship status so they can exercise offensive belligerent rights.<sup>237</sup> While this is stretching the definition in *UNCLOS*, it is not contrary to the purpose of the regulatory scheme, which was to limit belligerent rights to state vessels rather than to include private vessels. The provision was not about limiting the type of ships that could be warships. Other states might take a normative approach and see preventing the extension of the definition of warships to UMVs as promoting

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<sup>227</sup> Heintschel von Heinegg, ‘Warships’ (n 199) [16].

<sup>228</sup> Norris (n 9) 28.

<sup>229</sup> Program on Humanitarian Policy and Conflict Research at Harvard University, *HPCR Manual on International Law Applicable to Air and Missile Warfare* (Manual, 2013) r 1(x) (‘*HPCR Manual*’).

<sup>230</sup> Drafting Committee of the Group of Experts under the Supervision of Professor Yoram Dinstein, *Commentary to the HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge University Press, 2013) 37–8 (‘*Commentary to the HPCR Manual*’), discussed in Norris (n 9) 28.

<sup>231</sup> *Commentary to the HPCR Manual* (n 229) 38–9, discussed in Norris (n 9) 29.

<sup>232</sup> Norris (n 9) 30.

<sup>233</sup> Petrig (n 82).

<sup>234</sup> *UNCLOS* (n 2) art 101(a).

<sup>235</sup> Petrig (n 82) 128.

<sup>236</sup> *Ibid* 130.

<sup>237</sup> Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 67) 122–3; de Zwart (n 8) 315.

the peaceful uses of the seas and ensuring freedom of navigation for merchant vessels.<sup>238</sup> It would be better if states clarified their stance on this legal question.<sup>239</sup>

UMVs may also blur the boundaries between the state military and private companies. If a defence company has developed the programming for an autonomous vehicle, it could mean that the commander and crew responsible for the UMV are not responsible for the algorithm itself but only the parameters in which it operates. Would this mean that appointing someone responsible for a ship provides a way to allow it to be ‘commanded’ by a military officer, even if this responsibility did not reflect real oversight? Such issues can probably be avoided by deeming the commander responsible, given their obligation to understand how the device will operate, its capacities and limitations, and how it will carry out its missions.

## V CONCLUSION

It should be accepted that UMVs can be ships for the purposes of *UNCLOS*, allowing the new technology to be incorporated into the existing regulatory framework of the law of the sea. Adopting an evolutionary interpretation of ‘ship’ (and ‘vessel’) in *UNCLOS* is consistent with its object and purpose and acknowledges that ‘ship’ is a generic concept capable of being applied to a wide range of devices. A lack of an onboard crew does not fundamentally change the nature of a ship. It makes sense to impose the same basic requirements on the operation of UMVs as on other ships that navigate across the sea.

This is not to say that operating UMVs within the rules set by the law of the sea will be straightforward, and there will still be some significant practical challenges in exercising the rights and meeting the obligations of the law of the sea.<sup>240</sup> It will be up to flag states to ensure that the UMVs they register as ships satisfactorily meet the requirements of art 94 of *UNCLOS* and the other provisions relevant to their use. For example, in order to access innocent passage, UMVs will have to be able to turn off any systems collecting information prejudicial to the security of the coastal state.<sup>241</sup> Underwater UMVs will have to be able to navigate on the surface and show their flag.<sup>242</sup> It will also have to be possible for the coastal state to communicate with the vessel or the flag state so they can order it to leave if it violates the terms of innocent passage.<sup>243</sup> This is crucial, as it would allow the coastal state to exercise self-help rights to verify whether the ship is engaging in innocent passage and allow the vessel to clarify its intentions or adjust its behaviour in a reasonable period of time.<sup>244</sup> However, the technical challenges of complying with these requirements do not seem insurmountable.

Including UMVs in the category of ‘warships’ defined by art 29 of *UNCLOS* is more difficult. The explicit requirement for a warship to be ‘manned’ by a crew and commander may be an insurmountable hurdle. It would have to be accepted that the object and the purpose of the definition — to distinguish state vessels and

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<sup>238</sup> Nasu and Letts (n 21) 86.

<sup>239</sup> de Zwart (n 8) 315; Norris (n 9) 62.

<sup>240</sup> Norris (n 9) 37; Klein (n 67) 253–71.

<sup>241</sup> Norris (n 9) 36.

<sup>242</sup> *Ibid* 37.

<sup>243</sup> Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 63) 55.

<sup>244</sup> Norris (n 9) 36.

empower them with belligerent rights rather than set crewing requirements — overrides the apparent plain meaning of the provision. This article has shown a viable rationale for such an interpretive move. Besides, the strategic value of allowing these devices belligerent rights and using them to carry out attacks in armed conflict may prove irresistible to states. This appears to have been what has happened in relation to uncrewed aerial systems.

Even if the better view is that UUVs are ships and can even be warships, coastal states may nevertheless fail to respect the immunity of these devices and their entitlement to exercise the navigational rights.<sup>245</sup> It is likely that some states will be unwilling to recognise UUVs as ships, claiming that the status question is legally ambiguous<sup>246</sup> — although the range of possible devices and the low cost of at least some UUVs could lead to their widespread adoption. The newness of the technology makes it difficult to say. What is clear is that capturing or destroying a UUV has lower stakes than capturing or destroying a crewed vessel; a successful attack on a UUV is much less likely to risk lives. This might lead to states taking more risks when intercepting and destroying these devices. We must wait for more state practice to emerge to clarify the situation.<sup>247</sup>

States should make their legal position known. Given that the best view is that UUVs are ships capable of exercising navigational rights, more states should follow the lead of the US and be public about this conclusion. Doing so will help minimise the risk of conflict between states by helping other states appreciate the stakes of interfering with a UUV exercising a navigational right.

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<sup>245</sup> *Ibid* 46.

<sup>246</sup> Heintschel von Heinegg, 'Unmanned Maritime Systems' (n 67) 121.

<sup>247</sup> Schmitt and Goddard (n 7) 577.