

# When is a Ship a Ship?

## Use by State Armed Forces of Un-crewed 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 un-crewed 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, will be able to carry 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 paper 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 the UNCLOS. Failing to qualify as a ship would significantly limit the strategic value of UMVs, restricting their navigational rights and possibly preventing states 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 paper 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, 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.<sup>1</sup>

– Lt. Gen. Eric Smith, Deputy Commandant of the U.S. Marine Corps for Combat Development and Integration

Armed forces around the world are rapidly developing un-crewed 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, will be able to carry out some or all of their mission autonomously. But will they fit into the existing categories of the law of the sea? This paper 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*<sup>2</sup> (UNCLOS) – 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, the most important treaty in the law of the sea and recognised as being broadly reflective of customary international law.<sup>3</sup> Many of the provisions of UNCLOS, including the navigational rights, only apply to either ships or vessels. As these terms are used interchangeably in the treaty and refer to the same concept,<sup>4</sup> this paper 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 claiming sovereign immunity. Moreover, finding that UMVs did 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

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

<sup>2</sup> Opened for signature 10 December 1982, 1833 UNTS 3, 21 ILM 1261 (1982) (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 & 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 Shabti Rosenne (eds), *United Nations Convention on the Law of the Sea, 1982: A Commentary* (Martinus Nijhoff, 1985) vol 2, 45. More will be said on this later.

be shown that the better interpretation of ship in UNCLOS is capacious enough to include both remotely controlled and autonomous UUVs. This does not mean that *all* UUVs will necessarily be ships; it would depend on whether they were classified as a ship by a State through registration, a decision that would be made according to national law and the planned use of the device.

If UUVs do qualify as a ship, a secondary question is whether they can be categorised as a 'warship' and consequently have access to the belligerent rights. UNCLOS specifically defines warship in article 29, setting requirements that could be difficult for a UUV 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. 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 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 UUVs 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, inclusion in the definition of warship is more of a stretch.

The focus on the category of ship and warship in UNCLOS is necessary given that outside this treaty there is insufficient state practice and *opinio juris* to provide a basis for recognising rights of UUVs in customary international law. The limited (public) use by state armed forces of UUVs in contested areas means that their rights and obligations have not been clarified through the response of other states to their use.<sup>5</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 UUVs in these categories, others may prefer to limit the navigational rights and belligerent rights UUVs hold.<sup>6</sup> This creates a real risk for conflict where states have different views about the categorisation of a UUV. This has already happened, most prominently after the Chinese capture of an American UUV in the South China Sea in December 2016.<sup>7</sup>

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<sup>5</sup> Robert Veal, Michael Tsimplis and Andrew Serdy, 'The Legal Status and Operation of Unmanned Maritime Vehicles' (2019) 50(1) *Ocean Development & International Law* 23, 24.

<sup>6</sup> Michael N Schmitt and David S Goddard, 'International Law and the Military Use of Unmanned Maritime Systems' (2016) 98(902) *International Review of the Red Cross* 567, 577.

<sup>7</sup> James Kraska and Raul Pedrozo, 'China's Capture of U.S. 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>>; Veal, Tsimplis and Serdy (n 5) 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) 308.

Instead of waiting for the formation of new customary international law (or treaty) outside of the UNCLOS regime to clarify the situation recognising UUVs 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, or at least understand when it is likely to occur, is for states to follow the lead of the US and make their view of the legal position clear.

## II Military use of un-crewed maritime vehicles

States have developed and are already using UUVs and their use will continue to expand in the future.<sup>8</sup> State armed forces currently use UUVs for surveillance and reconnaissance, hydrographic surveying, mine countermeasures, special operations, and in restricted areas where the risk of collision is manageable.<sup>9</sup> The US Navy is seeking funding to build a 'ghost fleet' of autonomous maritime vehicles,<sup>10</sup> suggesting that in the not too distant future will see units and divisions of state armed forces capable of traversing the ocean, carrying out missions, destroying targets, all with no people on board. While this is unlikely in the short term,<sup>11</sup> it is clear UUVs 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

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<sup>8</sup> Andrew Norris, *Legal Issues Relating to Unmanned Maritime Systems* (US Naval War College, 2013) 1–2; Bradley Martin et al, *Advancing Autonomous Systems: An Analysis of Current and Future Technology for Unmanned Maritime Vehicles* (No RR-2751-NAVY, RAND Corporation, 2019) <[https://www.rand.org/pubs/research\\_reports/RR2751.html](https://www.rand.org/pubs/research_reports/RR2751.html)>.

<sup>9</sup> US Department of the Navy, 'The Commander's Handbook on the Law of Naval Operations' (NWP 1-14M/MCTP11-10B/COMBTPUB P5800.7A, August 2017) [2.3.4]; see also Veal, Tsimplis and Serdy (n 5) 24; Schmitt and Goddard (n 6) 570; Wolff Heintschel von Heinegg, 'Naval Technologies' in William H Boothby (ed), *New Technologies and the Law in War and Peace* (Cambridge University Press, 2018) 315, 317–18.

<sup>10</sup> Sam LaGrone, 'Navy Wants 10-Ship Unmanned "Ghost Fleet" to Supplement Manned Force', *USNI News* (News Article, 13 March 2019) <<https://news.usni.org/2019/03/13/navy-wants-ten-ship-3b-unmanned-experimental-ghost-fleet>>; David B Larter, 'A Classified Pentagon Maritime Drone Program Is About to Get Its Moment in the Sun', *Defense News* (News Article, 15 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/>>; 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>>. 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 & Commerce* 31. 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'.

<sup>11</sup> Martin et al (n 8).

dangerous environments.<sup>12</sup> Un-crewed autonomous technology is also being developed for commercial shipping.<sup>13</sup>

It is important to be precise about the differences between UMVs and previous advances in military technology that this paper will focus on. It is not about the autonomy itself, or 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 detects and destroys missiles attacking a warship<sup>14</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 showing the human operator only the most important information. These technological developments can be seen as a continuation of previous developments that assist seafarers 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 paper focuses on the legal consequences of UMVs having no people onboard the device. Heintschel von Heinegg offers a usefully concise definition of UMVs that this paper 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>15</sup>

UMVs come in many forms.<sup>16</sup> Some operate on the surface, others under the surface.<sup>17</sup> Some are remotely controlled from the shore or another ship through cable, by radio communication or GPS co-ordinates, aided by cameras and other sensors that are transmitted back to the command centre.<sup>18</sup> Others are pre-

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<sup>12</sup> de Zwart (n 7) 309–10; Schmitt and Goddard (n 6) 570.

<sup>13</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 21st Century* (Informa Law, 2020) 67, 67–70.

<sup>14</sup> United States Navy, 'AEGIS Weapon System', *United States Navy Fact File* (Web Page, 10 January 2019) <[https://www.navy.mil/navydata/fact\\_display.asp?cid=2100&tid=200&ct=2](https://www.navy.mil/navydata/fact_display.asp?cid=2100&tid=200&ct=2)>.

<sup>15</sup> Heintschel von Heinegg, 'Naval Technologies' (n 9) 319.

<sup>16</sup> See Martin et al (n 8) 5–28; Eric Van Hooydonk, 'The Law of Unmanned Merchant Shipping – An Exploration' (2014) 20 *Journal of International Maritime Law* 403, 403–6.

<sup>17</sup> Veal, Tsimplis and Serdy (n 5) 24.

<sup>18</sup> *Ibid.*

programmed to follow a particular route without human intervention, relying on on-board algorithms that avoid collision.<sup>19</sup> At their most basic, they include floats and gliders, which have been used for decades in marine scientific research and maritime surveying.<sup>20</sup> In the future, some UUVs will be capable of operating in a variety of ways, autonomously, remotely, or with a human onboard. For example, the sensitive and complex tasks (such as entering a busy harbour space) might be carried out by a pilot; whereas the sea voyage might be more autonomous.<sup>21</sup>

There are several examples of existing and proposed UUVs that give some sense of the variety of devices under development. In May 2019 the first US prototype of a submarine hunting UUV, named Sea Hunter, successfully sailed from San Diego to Hawaii and back without any crew onboard.<sup>22</sup> Sea Hunter is 40m long, is capable of travelling at a speed of 27 knots and is designed to detect and track enemy submarines until the submarine can be intercepted and destroyed by a friendly warship or aircraft.<sup>23</sup> This is only a taste of what is to come: the United States Navy has sought funding for even larger UUVs that will be the size of a corvette (a small warship).<sup>24</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 knots.<sup>25</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>26</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

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<sup>19</sup> Ibid.

<sup>20</sup> Katharina Bork et al, 'The Legal Regulation of Floats and Gliders – In Quest of a New Regime?' (2008) 39(3) *Ocean Development & 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(1) *International Law Studies* 79, 80–81 who trace the lineage of UUVs much further to fireships deployed in pre-modern naval warfare.

<sup>21</sup> Henrik Ringbom, 'Regulating Autonomous Ships – Concepts, Challenges and Precedents' (2019) 50(2–3) *Ocean Development & International Law* 141, 143.

<sup>22</sup> Franz-Stefan Gady, 'US Navy's Anti-Submarine Drone Ship Sailed Autonomously from San Diego to Hawaii and Back', *The Diplomat* (News Article, 6 February 2019) <<https://thediplomat.com/2019/02/us-navys-anti-submarine-drone-ship-sailed-autonomously-from-san-diego-to-hawaii-and-back/>>.

<sup>23</sup> Ibid.

<sup>24</sup> Ronald O'Rourke, *Navy Large Surface and Undersea Vehicles: Background and Issues for Congress* (No R45757, Congressional Research Service, 18 September 2019) 11 <<https://crsreports.congress.gov/product/pdf/R/R45757>>. O'Rourke explains that a corvette is larger than a patrol craft and smaller than a frigate. The US Navy envisioned the large UUVs being 200 feet (60m) to 300 feet (90m) in length and having a full load displacement of about 2,000 tons.

<sup>25</sup> 'The Wave Glider – How It Works', *Liquid Robotics* (Web Page, 2020) <<https://www.liquid-robotics.com/wave-glider/how-it-works/>>.

<sup>26</sup> 'Applications for Defense and Security', *Liquid Robotics* (Web Page, 2020) <<https://www.liquid-robotics.com/markets/defense-security/>>.

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>27</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>28</sup> and others as many as ten.<sup>29</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>30</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>31</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 recognises there will be a distinction between ships with automated processes and decision support assisting the crew, remotely controlled ships with crew onboard, remotely controlled ships without a crew onboard, and fully autonomous ships.<sup>32</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 paper is focussed 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 paper

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 most UMVs are likely to have a mix of remotely

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<sup>27</sup> This is particularly true in the debate about the legality of lethal autonomous weapons. For a useful overview see Merel AC Ekelhof, *The Distributed Conduct of War: Reframing Debates on Autonomous Weapons, Human Control and Legal Compliance in Targeting* (Vrije Universiteit Amsterdam, 2019) 71–3 <<https://research.vu.nl/en/publications/the-distributed-conduct-of-war-reframing-debates-on-autonomous-we>>; Merel AC Ekelhof, ‘Complications of a Common Language: Why It Is so Hard to Talk about Autonomous Weapons’ (2017) 22(2) *Journal of Conflict & Security Law* 311.

<sup>28</sup> Craig H Allen, ‘Determining the Legal Status of Unmanned Maritime Vehicles: Formalism vs Functionalism’ (2018) 49(4) *Journal of Maritime Law & Commerce* 477, 486.

<sup>29</sup> Martin et al (n 8) 6–7. See also Robert Veal and Michael Tsimplis, ‘The Integration of Unmanned Ships into the Lex Maritima’ (2017) 2017 *Lloyd’s Maritime & Commercial Law Quarterly* 303, 306.

<sup>30</sup> Martin et al (n 8) 7.

<sup>31</sup> Ringbom (n 21) 147. See also Veal and Tsimplis (n 29) 306 who describe a process where a remotely controlled device loses contact with the controller the system ‘automatically guides the craft to a specific location where it stops and awaits recover’.

<sup>32</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 21st Century* (Informa Law, 2020); this division is echoed in the four classes identified by Dean and Clack (n 13) 68.

controlled and autonomous functionality<sup>33</sup>) the paper 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 only available to ships, not to other ocean-going devices. A UMV being categorised as a ship means it has access to established rights of navigation and will be subject to widely accepted international standards.<sup>34</sup> Access to these rights will substantially increase UMV utility to militaries.<sup>35</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>36</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 ocean: innocent passage, transit passage, archipelagic sea lane passage, and in the high seas, freedom of navigation.<sup>37</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>38</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.

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<sup>33</sup> It is also 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 *Journal of International Maritime Law* 100.

<sup>34</sup> Veal, Tsimplis and Serdy (n 5) 39–40; Nasu and Letts (n 20) 91–2.

<sup>35</sup> Norris (n 8) 36.

<sup>36</sup> Veal, Tsimplis and Serdy (n 5) 25.

<sup>37</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.

<sup>38</sup> Ibid.

Innocent passage, which became established in the mid-nineteenth century,<sup>39</sup> allows ships to navigate within the territorial sea<sup>40</sup> of a foreign coastal state<sup>41</sup>, reconciling the territorial sovereignty of the coastal state with other states.<sup>42</sup> Innocent passage must be continuous and expeditious, and must be for the purpose of entering or leaving internal waters, or passing through without entering internal waters.<sup>43</sup> To qualify as ‘innocent’, the passage must not be prejudicial to the peace, good order or security of the coastal state.<sup>44</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 UMWs, 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 carrying out research or survey activities.<sup>45</sup> Innocent passage requires submarines and underwater vehicles to travel on the surface and to show their flag.<sup>46</sup> There is no support in UNCLOS or customary international law that a non-vessel ‘object’ or ‘device’ is permitted to access the right of innocent passage, and no other legal mechanism that would allow such a device to enter the territorial sea of another state.<sup>47</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 vessels unless it is giving effect to generally accepted international standards.<sup>48</sup> It means that all ships – including any UMWs that fall into this category – will be required to comply with these generally accepted standards. It appears that it would be possible for UMWs to meet the requirements of the main sources of these standards (the *International Convention for the Safety of Life at Sea*<sup>49</sup> (SOLAS) regime and the *International Regulations for Preventing Collisions at Sea*<sup>50</sup> (COLREGS)).<sup>51</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

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<sup>39</sup> Ibid 540.

<sup>40</sup> An area up to 12 miles from the baseline – generally the low-water line – of the coastal state.

<sup>41</sup> UNCLOS (n 2) art 17.

<sup>42</sup> Tanaka (n 37) 539.

<sup>43</sup> UNCLOS (n 2) arts 17; 18.

<sup>44</sup> Ibid art 19.

<sup>45</sup> Ibid. See also Nandan and Rosenne (n 4) 166.

<sup>46</sup> UNCLOS (n 2) art 20.

<sup>47</sup> Norris (n 8) 33.

<sup>48</sup> UNCLOS (n 2) art 21(2).

<sup>49</sup> Opened for signature 1 November 1974, 1184 UNTS 2 (entered into force 25 May 1980) (‘SOLAS’).

<sup>50</sup> Opened for signature 20 October 1972, 1050 UNTS 16 (entered into force 15 July 1977) (‘COLREGS’).

<sup>51</sup> Veal, Tsimplis and Serdy (n 5) 33.

commander and crew and in effect prohibit the passage of any UMWs.<sup>52</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>53</sup> A compromise was necessary because UNCLOS permitted the territorial sea claim coastal states could make to expand from 3 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>54</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>55</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. 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>56</sup> Archipelagic sea lanes passage is analogous to transit passage, and allows an archipelagic state to set aside sea lanes and air routes through its archipelagic waters<sup>57</sup> and the adjoining territorial sea.<sup>58</sup> As with transit passage, ships and vessels have the right to navigate through these sea lanes in normal mode.<sup>59</sup> Both navigational rights are only available to ships and vessels.

## 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

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<sup>52</sup> Ibid.

<sup>53</sup> UNCLOS (n 2) art 37.

<sup>54</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) 93–4; Norris (n 8) 37.

<sup>55</sup> Norris (n 8) 37.

<sup>56</sup> Noyes (n 54) 98–9; Norris (n 8) 38.

<sup>57</sup> Archipelagic waters are determined by drawing straight baselines connecting the outer edges of qualifying islands in an archipelago.

<sup>58</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) 149–50.

<sup>59</sup> UNCLOS (n 2) art 53.

qualify as warships have sovereign immunity.<sup>60</sup> This means that they cannot be subject to the jurisdiction of other states, even when they are in that states' territorial waters.<sup>61</sup> More specifically, sovereign immunity means a ship cannot be subject to enforcement actions by other states.<sup>62</sup> According to article 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>63</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>64</sup>).

### B Are UMMVs 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 UMMVs will fall into this category.<sup>65</sup> This is particularly as one of the assumptions made about the operation of ships – mainly due to technical limitations – is that they will have people on board.<sup>66</sup> If this assumption means that having a crew or commander on board the device is a critical component of being a ship, UMMVs will not satisfy the

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<sup>60</sup> See UNCLOS (n 2) arts 32, 95, 96, 236; Norris (n 8) 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) 871–2.

<sup>61</sup> Kraska, 'Military Operations' (n 60) 872; Norris (n 8) 27.

<sup>62</sup> UNCLOS (n 2) arts 32, 95, 96, 236.

<sup>63</sup> UNCLOS (n 2) art 32.

<sup>64</sup> For a good overview of this issue see Norris (n 8) 41–6. While most scholars seem to accept that sovereign immunity is dependent on classifying as a ship – see for example 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 & Commerce* 71, 97–8; Natalie Klein, 'Maritime Autonomous Vehicles within the International Law Framework to Enhance Maritime Security' (2019) 95 *International Law Studies* 29, 267–8. Others argue that as a UMMV 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 <[https://doi.org/10.1007/978-3-319-67266-3\\_7](https://doi.org/10.1007/978-3-319-67266-3_7)> ('Unmanned Maritime Systems'); Nasu and Letts (n 20) 90–1.

<sup>65</sup> Veal, Tsimplis and Serdy (n 5) 26; Kraska, 'The Law of Unmanned Naval Systems in War and Peace' (n 60) 51; Norris (n 8) 24.

<sup>66</sup> Norris (n 8) 26; Allen (n 28) 483; Heintschel von Heinegg, 'Unmanned Maritime Systems' (n 64).

definition and will be more difficult to fit into the UNCLOS regime.<sup>67</sup> The scholarly debate about this question is testament to this uncertainty,<sup>68</sup> and the ambiguity increases the risk that the categorisation of a device could differ between states and result in conflict.<sup>69</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 UUVs. 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>70</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>71</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 treaty, 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 UUVs 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>72</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 it would be consistent with the intention of the parties. The ‘intention’ of the parties understood by 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

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<sup>67</sup> de Zwart (n 7) 312.

<sup>68</sup> Schmitt and Goddard (n 6); Bartlett (n 64); Grome (n 10); Rob McLaughlin, ‘Unmanned Naval Vehicles at Sea: USVs, UUVs, and the Adequacy of the Law’ [2011] (2) *Journal of Law, Information & Science* 100 (‘Unmanned Naval Vehicles at Sea’); Veal, Tsimplis and Serdy (n 5); Norris (n 8); Daum (n 64); 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* (TMC Asser Press, 2014) 229; Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 60); Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 64); Grome (n 10); Klein (n 64).

<sup>69</sup> Veal, Tsimplis and Serdy (n 5) 25–6; Bartlett (n 64) 81–6.

<sup>70</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, 2012) 45, 56–7.

<sup>71</sup> Veal, Tsimplis and Serdy (n 5) 25.

<sup>72</sup> Eirik Bjorge, *The Evolutionary Interpretation of Treaties* (Oxford University Press, 2014) 59.

objective intention of the parties is by applying the VCLT, looking at the text, the object and purpose, and interpreting in good faith.<sup>73</sup>

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

... where 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, 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>74</sup>

The ICJ also adopted an evolutionary understanding of treaty terms in *Namibia*,<sup>75</sup> *Aegean Sea*,<sup>76</sup> *Gabčíkovo–Nagymaros*,<sup>77</sup> and *Pulp Mills*,<sup>78</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>79</sup> The preamble to UNCLOS reveal the high hopes of the parties: it was prompted by a 'desire to settle ... all issues relating to the law of the sea.'<sup>80</sup> It recognises that the 'problems of ocean space are closely interrelated and need to be considered as a whole,'<sup>81</sup> and that 'the codification and progressive development of the law of the sea' in UNCLOS will strengthen peace and security.<sup>82</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 ocean'<sup>83</sup> and has 'innate constitutional attributes' such as not allowing reservations (article 309) and making

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<sup>73</sup> Ibid 57–9.

<sup>74</sup> *Dispute Regarding Navigational and Related Rights (Costa Rica v Nicaragua) (Judgment)* [2009] ICJ Rep 213, 243, 66.

<sup>75</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, 53.

<sup>76</sup> *Aegean Sea Continental Shelf (Judgment)* (1978) ICJ Rep 3, 32 [77].

<sup>77</sup> *Gabčíkovo–Nagymaros Project (Hungary/Slovakia) (Judgment)* ICJ Rep 7, 78 [142].

<sup>78</sup> *Pulp Mills on the River Uruguay (Argentina v Uruguay) (Judgment)* (2010) ICJ Rep 14, 204.

<sup>79</sup> Richard Barnes, 'The Continuing Vitality of UNCLOS' in Jill Barrett and Richard Barnes (eds), *United Nations Convention on the Law of the Sea: A Living Instrument* (British Institute of International and Comparative Law, 2016) 459; Anna Petrig, 'The Commission of Maritime Crimes with Unmanned Systems: An Interpretive Challenge for UNCLOS' in Malcolm Evans and Sofia Galani (eds), *Maritime Security and the Law of the Sea: Help or Hindrance?* (Edward Elgar, 2020).

<sup>80</sup> UNCLOS (n 2) Preamble.

<sup>81</sup> Ibid.

<sup>82</sup> Ibid.

<sup>83</sup> Shirley Scott, 'The LOS Convention as a Constitutional Regime for the Oceans' in Alex Oude Elferink (ed), *Stability and Change in the Law of the Sea: The Role of the LOS Convention* (Martinus Nijhoff, 2005) 12.

amendment difficult (article 312).<sup>84</sup> These features suggest 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 to much smaller sailing vessels.<sup>85</sup> In addition, a cursory glance at the history of maritime technology shows the drafters must have been aware that technological change would occur in shipbuilding, navigation, and means of propulsion and 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>86</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 considered the status of UUVs accept that at least some will be ships.<sup>87</sup> 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>88</sup> Similarly, 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 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>89</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>90</sup>

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<sup>84</sup> Tim Stephens, 'Law of the Sea: UNCLOS as a Living Treaty. By Jill Barrett and Richard Barnes (Eds)' (2016) 86(1) *British Yearbook of International Law* 225. See also Barnes (n 79) 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 79).

<sup>85</sup> Noyes (n 70) 56; Veal and Tsimplis (n 29) 314.

<sup>86</sup> Allen (n 28) 482.

<sup>87</sup> See for example McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 68) 233; Allen (n 28) 513; Kraska, 'The Law of Unmanned Naval Systems in War and Peace' (n 60) 52; Daum (n 64) 85; Heintschel von Heinegg, 'Unmanned Maritime Systems' (n 64) 122; Veal, Tsimplis and Serdy (n 5).

<sup>88</sup> Kraska, 'The Law of Unmanned Naval Systems in War and Peace' (n 60) 50.

<sup>89</sup> McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 68) 231.

<sup>90</sup> International Maritime Organization, *Regulatory Scoping Exercise for the Use of Maritime Autonomous Surface Ships (MASS): Work Conducted by the CMI International Working Group on Unmanned Ships* (IMO Doc MSC 99/INF.8, 13 February 2018).

as part of the development of a Regulatory Scoping Exercise to figure out how to address the operation of UUVs in IMO instruments.<sup>91</sup> In a survey of states completed by Comité Maritime International that addressed the navigational rights of un-crewed vessels no concerns were expressed about treating un-crewed devices as 'vessels' or 'ships' under the law of the sea.<sup>92</sup>

There is also some state practice, mainly relating to the United States.<sup>93</sup> The 2017 *US Navy's Commander's Handbook on the Law of Naval Operations* refers to 'unmanned vessels' and says that these devices have 'sovereign immunity' as ships engaging in government non-commercial service.<sup>94</sup> Further, it says the United States 'recognizes reciprocal full sovereign immunity privileges for the equivalent vessels of other States.'<sup>95</sup> This appears to be in line with the approach taken to un-crewed aerial vehicles which are treated by US doctrine as military aircraft, despite not having personnel on board.<sup>96</sup> Examining the customary law implications of US Naval Doctrine, Allen did not find any objections from other states to this assertion and noted that it appears the US maritime services have acted consistently with that position without protest for many years.<sup>97</sup>

Other military manuals are more ambiguous. The German Manual of Armed Conflict states that UUVs 'can enjoy the sovereign immunity of government ships (including warships) provided they cannot be classified as such themselves.'<sup>98</sup> While it is unclear, it could be read as meaning that UUVs can share the status of another government ship (presumably one they are deployed from) in the event a UUV cannot be classified as a government ship in their own right. The 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>99</sup> also perhaps suggesting they can be ships. The New Zealand manual addresses the status, rights and obligations of unmanned aerial systems

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<sup>91</sup> Robert Veal, 'IMO Guidelines on MASS Trials: Interim Observations' (2019) 19(8) *Shipping & Trade Law* 1.

<sup>92</sup> Allen (n 28) 511.

<sup>93</sup> Ibid 509.

<sup>94</sup> US Department of the Navy (n 9) [2.1].

<sup>95</sup> Ibid [2.1.1].

<sup>96</sup> Norris (n 8) 21. See US Department of Defense, *Use of International Airspace by US Military Aircraft and for Missile/Projectile Firings* (Instruction 4540.1, 2 June 2015) 11.

<sup>97</sup> Allen (n 28) 510.

<sup>98</sup> Bundesministerium der Verteidigung (German Federal Ministry of Defence), *Law of Armed Conflict Manual* (2016) 141.

<sup>99</sup> Danish Ministry of Defence, *Military Manual on International Law Relevant to Danish Armed Forces in International Operations* (2016) 597.

(accepting they can be military aircraft)<sup>100</sup> but does not address similar systems operating on the ocean.

Given the above, it seems safe to conclude that the term ‘ship’ is broad enough to refer to some U MVs.<sup>101</sup> In fact, it would be strange if the state parties to UNCLOS only intended the treaty to apply to maritime devices already in existence; if they did, you would expect to see some effort to define ship more narrowly.<sup>102</sup> Instead, by declining to define this term (or ‘vessel’), the drafting of the treaty combined with its constitutional nature are evidence that an evolutionary approach is appropriate, allowing us to incorporate U MVs into the UNCLOS framework.<sup>103</sup> However, article 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 U MVs, article 94(4) of UNCLOS might be a basis for arguing an on-board master and crew is necessary. This provision sits within article 94, which sets out the duties of flag states to ‘effectively exercise its jurisdiction and control in administrative, technical and social matters.’<sup>104</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’. The requirements in subparagraph (4) further articulate the requirements of subparagraph (3) and are examples of measures deemed necessary to ensure safety at sea. Most importantly for our purposes, in the event that the device is recognised as a ship, subparagraph 94(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 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>105</sup> Finally, article 94(5) 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 might be necessary to secure their observance.’ 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>106</sup>

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<sup>100</sup> New Zealand Defence Force, *Manual of Armed Forces Law Volume 4: Law of Armed Conflict* (No DM 69 (2 ed), 2019) 10.7.

<sup>101</sup> Veal, Tsimplis and Serdy (n 5) 27.

<sup>102</sup> Ibid.

<sup>103</sup> Ibid.

<sup>104</sup> UNCLOS (n 2) art 94.

<sup>105</sup> Ibid.

<sup>106</sup> Veal and Ringbom (n 33) 103.

Several scholars have suggested that article 94 is a significant impediment to categorising UUVs as ships under UNCLOS, arguing that it requires flag states to ensure there is a commander and crew on board every ship.<sup>107</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>108</sup> and that it serves an ‘important security function’ as coastal States have someone on who to enforce criminal liability.<sup>109</sup>

There is no question that article 94 was drafted with conventional ships, operated by a master, officers and crew, in mind.<sup>110</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 where they are satisfied that they will meet certain safety criteria. The question of whether the UUVs have access to the rights of ships under UNCLOS should be separated from the question of whether an specific device is able to comply with all of the safety requirements of UNCLOS set out in provisions like article 94.<sup>111</sup> It is up to the flag state to ensure the UUV it was registering as a ship was compliant with UNCLOS obligations relating to safety, collision avoidance, and protection of the environment.<sup>112</sup> If the flag state failed, it would be in breach of UNCLOS but it would not change the status of the device as a ‘ship’.<sup>113</sup> This might seem like an unnecessary distinction, but it is important as it constrains the remedies available to a state that discovered a flagged UUV in their territorial waters.

Besides, it is not clear a flag state that registered a UUV as a ship would breach article 94. Article 94(4) is focused on the effective exercise of jurisdiction by the flag state and in ensuring the safety of ships. It should be enough to meet article 94 if the flag state is satisfied that the UUV 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 UUV 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

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<sup>107</sup> de Zwart (n 7) 312; Norris (n 8) 26; Schmitt and Goddard (n 6) 576–7.

<sup>108</sup> Veal and Tsimplis (n 29) 317.

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

<sup>110</sup> Van Hooydonk (n 16) 409.

<sup>111</sup> See Veal and Tsimplis (n 29) 314–334 for a detailed overview of the requirements a UUV would be required to meet under existing international law.

<sup>112</sup> *Ibid.* 314.

<sup>113</sup> Veal, Tsimplis and Serdy (n 5) 28; Veal and Tsimplis (n 29) 314.

controlling the ship might not be on board, they are clearly commanding the vessel and could be designated as the ship's master.<sup>114</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>115</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 an on-board master or a remote controller would have over the activities of the vessel when they were at the helm.<sup>116</sup> Nevertheless, as long as there was a person who was responsible, and the flag state was satisfied that person had the requisite knowledge and access to the device to operate it safely (in the context of its capabilities and its purpose) and who 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 for the entire time.<sup>117</sup> Besides, some have questioned the credibility of these requirements given the number of ships operating under 'less-than-strict flags of convenience' who are still permitted access to the UNCLOS navigational regime.<sup>118</sup>

Other requirements of article 94 are much easier to satisfy. The coastal State may be satisfied that the 'appropriate' number of crew on board the vessel is zero.<sup>119</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 scope for error or mistake.<sup>120</sup> This chain of reasoning is not unprecedented; it is effectively how US doctrine developed in relation to un-crewed aerial vehicles.<sup>121</sup>

The same is true of other provisions of UNCLOS that will, in effect, require U MVs to have certain capabilities to access certain rights. For example, to access innocent passage an underwater U MV would have to be able to surface and turn off some of its surveying and information collection. None of the conditions imposed on innocent passage, or 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

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<sup>114</sup> Veal, Tsimplis and Serdy (n 5) 36; Baughen (n 32) 131–2.

<sup>115</sup> Veal and Tsimplis (n 29) 318; Dean and Clack (n 13) 73–4.

<sup>116</sup> Van Hooydonk (n 16) 409–10.

<sup>117</sup> Veal and Tsimplis (n 29) 317.

<sup>118</sup> Van Hooydonk (n 16) 410.

<sup>119</sup> Veal and Tsimplis (n 29) 319–21.

<sup>120</sup> McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 68) 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>121</sup> Norris (n 8) 26–7.

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 if there are no people on board, such as ensuring the registration papers of the vessel are able to be inspected and enabling the UMV to communicate properly with other vessels. However, the purpose of these requirements could be presumably satisfied by ensuring the documents are available online in an appropriate electronic form<sup>122</sup> and providing information on how to communicate with the ‘master’ responsible for the ship. Some rights are likely to be impossible for U MVs to access in the short term, such as a U MV boarding another vessel as part of an inspection.<sup>123</sup> Nevertheless, providing that there is a satisfactory technical solution if 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 U MVs,<sup>124</sup> or at least require States to explain how they intend to satisfy them.

This begs the question of what the consequences for a State registering a U MV as a ship but in doing so failing to comply with the requirements of article 94 (even if the above workarounds for U MVs were accepted). At the very least, disputes between States about whether the registration of a ship was consistent with the article 94 requirements should be expected. This could result in coastal States attempting to regulate or interfere with some of the activities of U MVs not on the grounds of the device not being a ship, but because it was failing to satisfy generally accepted international rules relating to navigational safety. Article 21 of UNCLOS 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>125</sup> Importantly, article 21(2) provides that laws are not permitted to apply to the ‘design, construction, manning or equipment of foreign ships unless they are giving effect to generally accepted rule or standards.’<sup>126</sup>

Veal and Tsimplis found that while most of the ‘generally accepted’ rules of international law will be able to be met by a U MV<sup>127</sup>, they identified at least one critical obligation that could pose an insurmountable hurdle for autonomous

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<sup>122</sup> Van Hooydonk (n 16) 415.

<sup>123</sup> Klein (n 64).

<sup>124</sup> Van Hooydonk (n 16) 415.

<sup>125</sup> UNCLOS (n 2) art 21.

<sup>126</sup> Ibid art 21(2).

<sup>127</sup> Veal and Tsimplis (n 29) 314–330; also see Dean and Clack (n 13) 74–83 for a useful overview of some of the problems U MVs would have in complying international regulations relating to commercial shipping.

devices. Rule 2 of the COLREGs<sup>128</sup> – which apply to military vessels as well as civilian vessels – prioritises ‘good seamanship’ over strict compliance with the COLREG rules.<sup>129</sup> There may be situations where good seamanship, and thus the COLREGs, requires a departure from the rules.<sup>130</sup> Veal and Tsimplis query whether an autonomous system could determine when deviation from the rules is necessary is a ‘cognitive process of high sophistication, reliant, in particular, on nautical expertise and experience.’<sup>131</sup> While their concerns are warranted, fulfilling the requirements of good seamanship under the 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 the 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>132</sup> As Veal and Tsimplis recognise, this a similar challenge to the development and safe use of driverless cars.<sup>133</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 on innocent passage under article 21 by the coastal state are unclear. It would depend in part on whether the breaches of the rules meant that the passage was ‘non-innocent’: if the design of the UMV was in breach of article 19(2) – such as by not switching off intelligence gathering equipment – article 25(1) of UNCLOS allows coastal states to take ‘the necessary steps’ to prevent the passage.<sup>134</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>135</sup> However, breaching a coastal state requirement purporting to require a master to be on board the UMV would not necessarily make the passage non-innocent.<sup>136</sup> Outside of breaches of coastal state regulation relating to pollution, UNCLOS appears to be limited about what options are available to a coastal state if their article 21(1)

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<sup>128</sup> COLREGS (n 50) rule 2.

<sup>129</sup> Veal and Tsimplis (n 29) 324.

<sup>130</sup> Ibid 325.

<sup>131</sup> Ibid; a similar point is made by Baughen (n 32) 134; Veal and Ringbom (n 33) 110.

<sup>132</sup> Veal and Tsimplis (n 29) 325–6.

<sup>133</sup> Ibid 326.

<sup>134</sup> UNCLOS (n 2) art 25(1).

<sup>135</sup> Knut Hakapää, ‘Innocent Passage’ in Rüdiger Wolfrum (ed) *Max Planck Encyclopaedia of Public International Law* (Oxford University Press, 2013) [19]; Tanaka (n 37) 544.

<sup>136</sup> Tanaka (n 37) 543.

passage regulations are not complied with.<sup>137</sup> In this case, article 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>138</sup>

### 3 The search for a single definition of ship in UNCLOS

It is all very well to conclude that at least some UMVs 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 terms or establishing the boundaries of the category.<sup>139</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>140</sup> Importantly, most do not regard having a crew or commander onboard the vessel as an essential part of being a ship.<sup>141</sup> To give two prominent examples, 'vessel' is defined in the COLREGs as 'every description of water craft, including non-displacement craft, Wing-In-Ground craft and seaplanes, used or capable of being used as a means of transportation on water.'<sup>142</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 and floating platforms.'<sup>143</sup> This definition, like some from others treaties, will cover some UMVs.<sup>144</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>145</sup> Some national laws define ships and vessels on the basis of whether they can be used as a method of

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<sup>137</sup> Hakapää (n 135) 20.

<sup>138</sup> UNCLOS (n 2) art 31.

<sup>139</sup> Veal, Tsimplis and Serdy (n 5) 26.

<sup>140</sup> For a concise overview of the different definitions provided by international public and private law treaties see Van Hooydonk (n 16) 406–8.

<sup>141</sup> Ibid 409.

<sup>142</sup> COLREGS (n 50).

<sup>143</sup> *International Convention for the Prevention of Marine Pollution from Ships*, opened for signature 11 February 1973, 1340 UNTS 184 (entered into force 2 October 1983), as amended by *Protocol of 1978 Relating to the International Convention for the Prevention of Pollution from Ships*, 1973, opened for signature 1 June 1978, 1340 UNTS 62 (entered into force 2 October 1983) ('MARPOL').

<sup>144</sup> Allen (n 28) 481–2. See also Leonida Giunta, 'The Enigmatic Juridical Regime of Unmanned Maritime Systems' (Conference Paper, OCEANS 2015 – Genova, 18–21 May 2015) 1.

<sup>145</sup> Van Hooydonk (n 16) 408.

transportation, others adopt a more general definition of whether they be used in maritime navigation, or if they can float, or by looking at the size of the device.<sup>146</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 to address the purposes of the specific convention<sup>147</sup> or domestic legislation. The variety of definitions make it necessary to consider the specific treaty to determine whether it applies to UMTs.<sup>148</sup> Any specific definition provided by a treaty of ship or vessel would apply in the context of that treaty, and this may operate to exclude UMTs 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 in the law of the sea. Besides, given most of these other treaties specifically exclude state vessels being operated for non-commercial purposes, it is of limited significance in the military context.<sup>149</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>150</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, Daum considers a range of international treaties and argues that a ‘ship’ must have ‘transportation features.’<sup>151</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>152</sup> such as transporting weapons from one location to another.<sup>153</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>154</sup> This means he finds that if a UMT is not undertaking a ‘transportation mission, meaning carrying goods, people, weapons or other items from port to port’ it ceases to be a ship.<sup>155</sup> Daum’s distinction between carrying weapons and carrying sensors is hard to accept:

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<sup>146</sup> Ibid 408–9; also see Veal and Tsimplis (n 29) 308–9, 310–12; Dean and Clack (n 13) 70–2.

<sup>147</sup> Veal, Tsimplis and Serdy (n 5) 26; Schmitt and Goddard (n 6) 577; Van Hooydonk (n 16) 406–7.

<sup>148</sup> Allen (n 28) 494.

<sup>149</sup> See for example SOLAS (n 49) reg 1.1; MARPOL (n 143), art 3(3).

<sup>150</sup> Veal, Tsimplis and Serdy (n 5) 27–8.

<sup>151</sup> Daum (n 64) 80.

<sup>152</sup> Ibid 82.

<sup>153</sup> Ibid 83–4.

<sup>154</sup> Ibid.

<sup>155</sup> Ibid 84.

both can be essential to the purpose of a military ship. It would also be a strange outcome if a maritime device was switching in and out of such a basic category of the law of the sea and would increase ambiguity and confusion about what rights and obligations a UMV had at any moment in time.

Similarly, Allen set out to find a definition by assessing ‘the sum of each specialised, restricted definition’ in international law, searching for something broad enough to include all the references to ‘ship’ or ‘vessel’ in UNCLOS. 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>156</sup> This definition does not require an on-board crew, but like the definition proposed by Daum, leaves open the question of what exactly needs to 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>157</sup> He argues that:

If it 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 (i.e. transport) sensors and other equipment that enhance or extend the user’s capabilities and for which navigation rights are essential to its function.<sup>158</sup>

The American Branch of the ILA decided against recommending a requirement for a transportation function, instead defining ship as any ‘human-made device, including submersible vessels, capable of traversing the sea.’<sup>159</sup> Norris, who supports this definition, observes that this definition provides that the essence of vessel is that it can move through water.<sup>160</sup> Allen argues this definition may be too broad as it could include torpedos and smart mines, devices that he considers clearly outside of the category.<sup>161</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>162</sup> Similarly, Noyes observes that ‘the legal contexts in which the word ‘ship’ is used vary so significantly that it may be

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<sup>156</sup> Allen (n 28) 494.

<sup>157</sup> Ibid 496.

<sup>158</sup> Ibid.

<sup>159</sup> George K Walker, *Definitions for the Law of the Sea: Terms Not Defined by the 1982 Convention* (Martinus Nijhoff, 2011) 55–61, 300–1.

<sup>160</sup> Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 60) 53.

<sup>161</sup> Allen (n 28) 495.

<sup>162</sup> Nandan and Rosenne (n 4) 46.

inappropriate to specify one definition.’<sup>163</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>164</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 apply to these devices, it would be a ‘nonsense’ to apply the right of hot pursuit (article 111). Instead, he says we should be comfortable with different definitions of ‘ship’ for different settings.<sup>165</sup> He uses article 91 of UNCLOS to demonstrate his preferred approach. Article 91(2) requires that ‘[e]very state ... issue to ships to which it has been granted the right to fly its flag documents to that effect’, which he suggests should be read as excluding smaller vessels (given not all states issue documents to small boats). In contrast, he says there is ‘no reason’ to exclude smaller vessels from the requirement of article 91(1) for each state to ‘fix the conditions for the grant of its nationality to ships’ and that there must be ‘a genuine link’ between the state and the ship.<sup>166</sup> Noyes argues 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>167</sup> Petrig makes a similar point, arguing the definition of ‘ship’ differs from rule to rule and the subject matter and context, arguing that ‘a single definition is neither possible nor helpful.’<sup>168</sup>

There are advantages to this approach. Deciding that *all* UMGs *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 will be regulated.<sup>169</sup> Instead, some have proposed we should examine a range of factors on a case-by-case basis such as appearance, size, the mission it has been tasked with, and in the UMG context, the degree of autonomous operation.<sup>170</sup> However, it is not an

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<sup>163</sup> Noyes (n 70) 55.

<sup>164</sup> Ibid 57.

<sup>165</sup> Ibid 58.

<sup>166</sup> Ibid 58–9.

<sup>167</sup> Ibid 61.

<sup>168</sup> Petrig (n 79); this is also the view of Klein (n 64) 251.

<sup>169</sup> Veal, Tsimplis and Serdy (n 5) 25; Norris (n 8) 25–6.

<sup>170</sup> Norris (n 8) 25–6; Klein (n 64) 10.

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 there is a need for any definition at all. Veal, Tsimplis and Serdy argue that the lack of a definition in UNCLOS means that what constitutes a ship is left to individual states to be determined by national law.<sup>171</sup> They find support for their argument in article 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 onboard.<sup>172</sup> This conclusion leads them to argue that once the flag state has determined the status of a craft is a ship and has access to the navigational rights, this must be accepted by other states.<sup>173</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>174</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 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 Treves (who was part of the Italian delegation at the UNCLOS negotiations), who observed that:

[I]t 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

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<sup>171</sup> Veal, Tsimplis and Serdy (n 5) 28. See also Veal and Tsimplis (n 29).

<sup>172</sup> Veal, Tsimplis and Serdy (n 5) 27.

<sup>173</sup> Ibid 28.

<sup>174</sup> Veal and Tsimplis (n 29) 309.

acknowledged rights of the State to which the 'ship'/'vessel' belongs.<sup>175</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 State, and thereby being recognised as a 'ship', is the crucial criteria for accessing the navigational rights provided by UNCLOS.<sup>176</sup> This approach – which is very broad – would evidently be broad enough to encompass UUVs 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 UUV, but this is no different 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>177</sup> Clearly, UUVs might be the sort of device that is used in this way. This raises the question of when UUVs deployed by government ships (including warships) will be considered independent entities, and when they will be merely components of their deploying platform.<sup>178</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>179</sup>) it is becoming more sophisticated. For example, US Navy is developing surface drones that could be incorporated into the perimeter security systems of warships and used as part of 'layered ship protection'.<sup>180</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.

Consistently 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 the navigational rights is how it is categorised by the flag state. It 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>181</sup> and that they can

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<sup>175</sup> Tullio Treves, 'Navigation' in René-Jean Dupuy and Daniel Vignes (eds), *A Handbook on the New Law of the Sea* (Martinus Nijhoff, 1991) 835, 842.

<sup>176</sup> Van Hooydonk (n 16) 409.

<sup>177</sup> Norris (n 8) 23; McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 68) 238.

<sup>178</sup> Norris (n 8) 23; McLaughlin, 'Unmanned Naval Vehicles at Sea' (n 68) 109–10.

<sup>179</sup> See Bork et al (n 20).

<sup>180</sup> Kris Osborn, 'The U.S. 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>>.

<sup>181</sup> US Department of the Navy (n 9) [2.3.6].

be deployed by larger vessels ‘as long as their employment complies with the [applicable] navigational regime’.<sup>182</sup> Norris interprets this ambiguous statement as meaning that the UMV can be deployed by the larger vessel as long as it is consistent with the navigational regime that applies to the larger vessel at the time of deployment.<sup>183</sup> A failure to comply with these requirements may mean that the deploying unit faces consequences for the violation.<sup>184</sup> However, once the UMV is deployed, it has an independent entitlement to exercise navigational rights.<sup>185</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 consistent with this: they argue that while 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>186</sup>

An emerging and linked categorisation challenge is 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>187</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 was 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. De Zwart argues that the ‘possibility of a networked fleet’ means we should consider a consistent characterisation of U MVs, 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 U MV.<sup>188</sup>

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<sup>182</sup> Norris (n 8) 23.

<sup>183</sup> Ibid.

<sup>184</sup> Ibid 23–4.

<sup>185</sup> Ibid.

<sup>186</sup> Veal, Tsimplis and Serdy (n 5) 30. See also de Zwart (n 7) 311.

<sup>187</sup> David Pinion, ‘The Navy and Marine Corps Need to Prepare for the Swarm of the Future’, *War on the Rocks* (Blog Post, 28 March 2018) <<https://warontherocks.com/2018/03/the-navy-and-marine-corps-must-plan-for-the-swarm-of-the-future/>>.

<sup>188</sup> de Zwart (n 7) 311.

#### IV When is a vessel a warship?

While it seems safe to conclude that UMGs 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 a 'warship.' Warships – which are a subset of ships and vessels – are generally understood to be the only vessels that can exercise belligerent rights.<sup>189</sup> This means 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 which assist naval forces, are targetable under international humanitarian law, and can be crewed by civilians. Naval auxiliaries are generally understood to be unable to exercise belligerent rights. This means that strategic and tactical value of UMGs would be significantly limited if they are treated only as ships, and not warships.<sup>190</sup>

Warships are explicitly defined in article 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>191</sup>

It would be straightforward for a UMG to meet some of the requirements of this definition. The UMGs considered in this paper will belong to the armed forces of a state, and a device could easily be given external marks.<sup>192</sup> However, it is much less clear that a UMG could be 'under the command' of an officer and 'manned by a crew'.

It might seem that this is a similar situation as the impact of article 94 of UNCLOS on the category of 'ship', and that it could be argued that rather than limiting the definition of warships, this provision just obliges states to ensure that their warships have these features. However, this is not the case: the requirement for the warships to be 'under the command' of an officer and 'manned by a crew' are specifically part of the definition of 'warship' in article 29. Satisfying these criteria is a threshold requirement for being classified as a 'warship.' In contrast, article 94 places an obligation on states to ensure those devices they register as

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<sup>189</sup> Norris (n 8) 22; Wolff Heintschel von Heinegg, 'Warships' in Rüdiger Wolfrum (ed) *Max Planck Encyclopaedia of Public International Law* (Oxford University Press, October 2015); Danish Ministry of Defence (n 99) 584; New Zealand Defence Force (n 100) 10; Norwegian Chief of Defence, *Manual of the Law of Armed Conflict* (2013) 220; US Department of the Navy (n 9) [2.2.1]; US Department of Defense, *Law of War Manual* (Office of General Counsel, Department of Defense, 2016) 887.

<sup>190</sup> Nasu and Letts (n 20) 86.

<sup>191</sup> UNCLOS (n 2) art 129.

<sup>192</sup> McLaughlin, 'Unmanned Naval Vehicles and the Law of Naval Warfare' (n 68) 239.

ships meet certain safety requirements. The designation of the device as a ‘ship’ precedes the application of article 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 it reveals about the object and purpose of article 29. 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>193</sup> The prohibition on privateering can be traced to the *Declaration Respecting Maritime Law*<sup>194</sup> of 1856, agreed as part of the Treaty of Paris ending the Crimean War.<sup>195</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>196</sup> Importantly, this agreement required warships to belong to the navy of a state, have a naval commander and be crewed by people subject to naval discipline.<sup>197</sup>

This rule was refined in 1907 by article 2 to 6 of the *Hague Convention (VII) relating to the Conversion of Merchant Ships into Warships*,<sup>198</sup> which added that before a converted merchant vessel must clearly have the characteristics of a warship before its status could change.<sup>199</sup> This treaty had most of the requirements that were later to be found in the UNCLOS definition,<sup>200</sup> but instead of applying generally to ships belonging to the armed forces of the state, it was limited to the naval forces. This was adjusted in UNCLOS to reflect that military ships are not exclusively operated by navies.<sup>201</sup> Depending on the structure of the armed forces in the relevant state, the definition is wide enough to cover services like the coast guard and frontier police.<sup>202</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 it was not a private vessel. The purpose of the

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<sup>193</sup> Heintschel von Heinegg, ‘Warships’ (n 189) 3.

<sup>194</sup> Opened for signature 16 April 1865, 115 CTS 1.

<sup>195</sup> Norris (n 8) 57; Heintschel von Heinegg, ‘Warships’ (n 189) 3; For more see Jan Lemnitzer, *Power, Law and the End of Privateering* (Palgrave Macmillan, 2014).

<sup>196</sup> Norris (n 8) 57.

<sup>197</sup> Heintschel von Heinegg, ‘Warships’ (n 189) 3.

<sup>198</sup> Opened for signature 18 October 1907, 205 CTS 319 (entered into force 26 January 1910).

<sup>199</sup> Norris (n 8) 57–8; McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 68) 238.

<sup>200</sup> Nandan and Rosenne (n 4) 249–50; Norris (n 8) 58.

<sup>201</sup> Nandan and Rosenne (n 4) 250–1; Heintschel von Heinegg, ‘Warships’ (n 189) 5.

<sup>202</sup> Nandan and Rosenne (n 4) 252.

law was to limit certain belligerent naval activities to state ships,<sup>203</sup> not to prevent UUVs from being used for military purposes.<sup>204</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.

Regardless, applying this to determine what being ‘under the command of an officer’ and ‘manned by a crew’ appears straightforward: it appears to require the presence of a military officer and crew on the vessel.<sup>205</sup> This appears to be the approach states are currently taking to UUVs. The 2017 US Naval Commanders Handbook describes the definition of warship in a way that suggests UUVs would not fall into that category. It does not include UUVs in the section on warships,<sup>206</sup> but rather deals with them in a separate section addressing ‘Other Naval Craft.’<sup>207</sup> Similarly, the Danish Military Manual defines warships according to the UNCLOS definition (requiring they be under the command of an officer and with a crew under armed forces discipline) without any suggestion that an un-crewed device could meet the requirements.<sup>208</sup> The Norwegian Manual of the Law of Armed Conflict repeats the requirements of warships from UNCLOS without further comment.<sup>209</sup> While the New Zealand Manual of Armed Forces Law 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 it be crewed ‘by personnel’.<sup>210</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>211</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

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<sup>203</sup> Heintschel von Heinegg, ‘Warships’ (n 189) 16.

<sup>204</sup> Nasu and Letts (n 20) 85.

<sup>205</sup> Schmitt and Goddard (n 6) 579.

<sup>206</sup> US Department of the Navy (n 9) [2.2].

<sup>207</sup> Ibid [2.3].

<sup>208</sup> Danish Ministry of Defence (n 99) 635.

<sup>209</sup> Norwegian Chief of Defence (n 189) 220. This manual was published in 2013 and translated to English in 2018.

<sup>210</sup> New Zealand Defence Force (n 100).

<sup>211</sup> McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ (n 68) 239.

question, and its full physical manifestation includes the control and controller sitting ashore.<sup>212</sup>

Veal, Tsimplis and Serdy reach the same conclusion,<sup>213</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>214</sup> They explain that:

One approach may be to apply a liberal interpretation to manning so as to include remote control and pre-programming. This seems to be in keeping with the technological reality, particularly to the extent that remote control gives the shore-based controller real-time control over the UMV, operating at the surface, comparable to a manned equivalent.<sup>215</sup>

They are less willing, however, to extend the definition to allow for pre-programmed autonomous operations satisfying the command and crewing requirements saying this would stretch ‘the unambiguous wording of Article 29 too far.’<sup>216</sup>

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 vessels could be considered warships if the persons remotely operating or controlling them are subjected to regular armed forces discipline.’<sup>217</sup> Norris says that ‘at first glance’ it appears that a UMV could never qualify as a warship as it does not have a crew, but points to the legal treatment of un-crewed aerial vehicles to show how the difficult components of the definition might be dealt with.<sup>218</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>219</sup> the commentary to which reveals the experts involved in manual’s development decided 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>220</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>221</sup>

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<sup>212</sup> Ibid.

<sup>213</sup> Veal, Tsimplis and Serdy (n 5) 30.

<sup>214</sup> Ibid 30–31.

<sup>215</sup> Ibid.

<sup>216</sup> Ibid; Schmitt and Goddard (n 6) 579.

<sup>217</sup> Heintschel von Heinegg, ‘Warships’ (n 189) 16.

<sup>218</sup> Norris (n 8) 28.

<sup>219</sup> Harvard Program on Humanitarian Policy and Conflict, *Commentary on the HPCR Manual on International Law Applicable to Air and Missile Warfare* (Cambridge University Press, 2013).

<sup>220</sup> Norris (n 8) 28.

<sup>221</sup> Ibid 29.

Norris suggests that the same interpretive manoeuvres would be possible with UUVs, allowing for classification as warships.<sup>222</sup>

Petrig identifies a similar problem for the application of the definition of piracy in article 101(a) of UNCLOS to UUVs.<sup>223</sup> Article 101(a) provides that piracy is illegal acts of violence, detention or depredation ‘committed for private ends by the crew or passengers of a private ship’.<sup>224</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>225</sup> However, she says that its role in providing a definition for criminal activity means that a stricter interpretive approach, paying more regard to the principle of legality, should probably be preferred.<sup>226</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 to grant UUVs warship status so they can exercise offensive belligerent rights.<sup>227</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 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 definition of warships extending to UUVs would be promote the peaceful uses of the seas and ensure freedom of navigation for merchant vessels.<sup>228</sup> It would be better if states clarified their stance on this legal question.<sup>229</sup>

UUVs 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 the commander and crew responsible for the UUV are not responsible for the algorithm itself, but only the parameters in which it operates. Would this mean that appointing someone responsible for the ship provide 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 its limitations, and how it will carry out its missions.

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<sup>222</sup> Ibid 30.

<sup>223</sup> Petrig (n 79).

<sup>224</sup> UNCLOS (n 2) art 101.

<sup>225</sup> Petrig (n 79).

<sup>226</sup> Ibid.

<sup>227</sup> Heintschel von Heinegg, ‘Unmanned Maritime Systems’ (n 64) 122–3; de Zwart (n 7) 315.

<sup>228</sup> Nasu and Letts (n 20) 86.

<sup>229</sup> de Zwart (n 7) 315; Norris (n 8) 62.

## V Conclusion

It should be accepted that UMGs 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 UMGs as on other ships that navigate across the sea.

This is not to say that operating UMGs within the rules set by the law of the sea will be straightforward, and there will still be some significant practical challenges to exercise the rights and meet the obligations of the law of the sea.<sup>230</sup> It will be up to flag states to ensure that UMGs they register as ships satisfactorily meet the requirements of article 94 of UNCLOS, and the other provisions relevant to their use. For example, in order to access innocent passage, UMGs will have to be able to turn off any systems collecting information prejudicial to the security of the coastal state.<sup>231</sup> Underwater UMGs will have to be able to navigate on the surface and show their flag.<sup>232</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>233</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 for the vessel to clarify its intentions or adjust its behaviour in a reasonable period of time.<sup>234</sup> However, the technical challenges of complying with these requirements do not seem insurmountable.

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

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<sup>230</sup> Norris (n 8) 37; Klein (n 64) 253–71.

<sup>231</sup> Norris (n 8) 36.

<sup>232</sup> Ibid 37.

<sup>233</sup> Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (n 60) 55.

<sup>234</sup> Norris (n 8) 36.

Even if the better view is that UMMVs 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>235</sup> It is likely that some states will be unwilling to recognise UMMVs as ships by claiming the status question is legally ambiguous<sup>236</sup> – although the range of possible devices and the low cost of at least some UMMVs 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 UMMV has lower stakes than capturing or destroying a crewed vessel; a successful attack on a UMMV is much less likely to risk lives. This might lead to states taking more risks with intercepting and destroying these devices. We must wait for more state practice to emerge to clarify the situation.<sup>237</sup>

States should make their legal position known. Given the best view is that UMMVs 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 UMMV exercising a navigational right.

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<sup>235</sup> Ibid 46.

<sup>236</sup> Heintschel von Heinegg, 'Unmanned Maritime Systems' (n 64) 121.

<sup>237</sup> Schmitt and Goddard (n 6) 577.