

Unmanned offender and enforcer vessels and the multi-dimensional concept of ‘ship’ under the United Nations Convention on the Law of the Sea

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Abstract

Maritime history dates back thousands of years, and one constant throughout this time has been that ships navigating the seas have people aboard. With the recent appearance of unmanned ships on our seascape, however, this certainty has come to an end. This chapter probes the consequences that the turn to unmanned ships entail for the provisions of the UNCLOS, which were crafted based on the assumption that ships carry an on-board crew. Concretely, it enquires into the impact that the absence of people on board may have on the UNCLOS provisions that pertain to maritime crime and comprise a reference to ‘ships’. This is done by considering the multi-dimensional nature of the concept of ‘ship’, which is used to refer to moveable property but also as a cipher for flag states and even human beings. The analysis demonstrates that the advent of unmanned ships cannot be accommodated by the UNCLOS without further ado. This holds true not only for the substantive provisions of the Convention but also, and this is arguably even more significant, for the jurisdictional rules it comprises.

Keywords: unmanned ships, autonomous ships, United Nations Convention for the Law of the Sea, UNCLOS, flag state principle, nationality

I. About the assumption of ships having persons on board

If there is but one truism throughout the thousands of years of maritime history, it is that ships have persons on board – that they are manned. This certainty has come to an end with the arrival of unmanned ships plying the seas and oceans – and they are no longer a mere glimpse of the future. Their introduction entails that persons ‘who use the sea through the medium of a ship’¹ are no longer aboard the vessel, possibly not even at sea. The absence of an on-board crew, it is posited, has serious repercussions for the provisions of the United Nations Convention on the Law of the Sea (UNCLOS),² including those governing the suppression of maritime crime. At first glance, this may seem somewhat paradoxical given that various commentators, including

¹ Herman Meyers, *The Nationality of Ships* (Springer 1967) 12.

² United Nations Convention on the Law of the Sea (adopted 10 December 1982, entered into force 16 November 1994) 1833 UNTS 3.

the author of the present chapter,³ have stressed that persons play a (too) subordinate role in the UNCLOS.⁴ Why should the mechanics of the UNCLOS be disturbed by the absence of persons on board when ‘[p]eople seem to occupy a space so small [in the UNCLOS] that it can be compared to that of a rock or a small island’⁵ – with the difference that only the latter of the two has a dedicated part within the Convention?⁶

The reason is found in the assumptions underpinning the provisions of the UNCLOS, many of which are called into question by unmanned ships. Quite fundamentally, unmanned vessels query the basic premise on which rules of the law of the sea, including those of the UNCLOS, rest: that a ship carries an on-board crew responsible for its navigation, task and mission.⁷ Furthermore, as regards UNCLOS’ provisions pertaining to maritime crime specifically, the turn to unmanned ships challenges the presumption that perpetrators are on board the offender craft and that law enforcement officials are embarked on ships authorized to enforce the law. As a direct consequence, it can no longer be taken for granted that enforcers and suspects encounter each other at sea and that a physical human-human interaction ‘in theatre’ takes place. This begs the question whether unmanned ships, which challenge these assumptions, can be accommodated in the UNCLOS.

To be sure, the use of unmanned offender and enforcer crafts will never entail the complete absence of human involvement⁸ – even if the term ‘unmanned’ feeds this perception.⁹ Yet

³ See, e.g., Anna Petrig, *Human Rights and Law Enforcement at Sea: Arrest, Detention and Transfer of Piracy Suspects* (Brill Nijhoff 2014) 440-41; Anna Petrig and Marta Bo, ‘The International Tribunal for the Law of the Sea and Human Rights’ in Martin Scheinin (ed), *Human Rights Norms in ‘Other’ International Courts* (CUP 2019) 361.

⁴ See, e.g., Irini Papanicolopulu, ‘Human Rights and the Law of the Sea’ in David Attard, Malgosia Fitzmaurice, and Norman Martinez (eds), *The IMLI Manual on International Maritime Law, Volume 1: The Law of the Sea* (OUP 2014) 510.

⁵ Irini Papanicolopulu, ‘The Law of the Sea Convention: No Place for Persons?’ (2012) 27 *The International Journal of Marine and Coastal Law* 867, 868.

⁶ *ibid*; see Part VIII of the UNCLOS entitled ‘Regime of islands’ and mentioning rocks specifically.

⁷ See, *ex plurimis*, Craig H Allen, ‘Determining the Legal Status of Unmanned Maritime Vehicles: Formalism vs Functionalism’ (2018) 49(4) *Journal of Maritime Law & Commerce* 477, 483; Simon McKenzie, ‘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’ (Law and the Future of War Research Paper No 3, August 2020) 12; Måns Jacobsson, ‘What Challenges Lie Ahead for Maritime Law?’ in Proshanto K Mukherjee, Maximo Q Mejia and Jingjing Xu (eds), *Maritime Law in Motion* (Springer 2020) 279. Regarding the master specifically, see, e.g., Goran Vojkovic and Melita Milenkovic, ‘Autonomous Ships and Legal Authorities of the Ship Master’ (2020) 8 *Case Studies on Transport Policy* 333, 333. For a state’s view, see Danish Maritime Authority, ‘Regulation and reports about maritime technology’ <www.dma.dk/Vaekst/MaritimDigitalisering/ReguleringMaritimTeknologi/Pages/default.aspx> accessed 15 February 2021.

⁸ Stressing this for unmanned merchant ships: Eric Van Hooydonk, ‘The Law of Unmanned Merchant Shipping – An Exploration’ (2014) 20 *The Journal of International Maritime Law* 403, 405-06.

⁹ For this very reason Paul D Scharre, ‘The Opportunity and Challenge of Autonomous Systems’ in Andrew P Williams and Paul D Scharre (eds), *Autonomous Systems: Issues for Defence Policymakers* (NATO, Supreme

automation impacts *how* people are involved in the operation of vessels as regards the manner, time and location. It is posited that this is a sufficient enough change to unhinge a series of concepts – and, in specific constellations, to disturb the entire mechanics – of UNCLOS’ provisions governing the suppression of maritime crime. This holds true not only for the substantive provisions of the Convention but also, and this is arguably even more significant, for the jurisdictional rules it comprises.

It is against this background that the present chapter probes the consequences that the turn to unmanned ships, and the resultant absence of persons on board, entail for the provisions of the UNCLOS governing the suppression of maritime crime. What does the shift from on-board actors – be it the master, commanding officer, law enforcement official, crew member or passenger – to actors who are potentially not even at sea imply for the applicability and relevance of these provisions? To tailor this book-filling topic to the size of a mere chapter, the analysis focuses on one key concept of the UNCLOS – the ‘ship’. Concretely, it enquires into the impact that the absence of people on board may have on those provisions of the UNCLOS that pertain to maritime crime and comprise a reference to ‘ships’. This is done by considering the multi-dimensional nature of the concept of ‘ship’, which is used to refer to moveable property but also as a cipher for flag states and even human beings.(Section III). This analysis is preceded by an overview highlighting that unmanned ships are already – and will increasingly become – an important component of the commission and suppression of maritime crime (Section II), which is reason enough to ask whether UNCLOS’ provisions on maritime crime continue to function as a ‘system of regulation’.

Before delving into the analysis, two clarifications are in order. First, as the questions raised above are complex and multi-layered, this chapter does not attempt to answer them in a comprehensive or conclusive manner. The aim is rather to contribute to the inventory of legal issues raised by the increased reliance on ship automation technology by offenders and enforcers alike and to offer appropriate analytical lenses for their future, in-depth examination. Second, as far as terminology is concerned, the notion of ‘autonomous ships’ is slowly taking hold to refer to this new type of ships.¹⁰ Yet, at the present juncture, both the concept of ‘autonomy’ and the

Allied Command, 30 September 2015) 19 prefers the qualifier ‘uninhabited’. As the term ‘unmanned ship’ gained certain acceptance in legal scholarship, it is the one used here.

¹⁰ The International Maritime Organization’s (IMO) uses the term ‘Maritime Autonomous Surface Ship’ to denote ships ‘which, to a varying degree, can operate independent of human interaction’: International Maritime Organization ‘Report of the LEG Working Group on MASS’ (29 March 2019) IMO Doc LEG 106/WP.5, Annex, para 3.

various ‘levels of autonomy’ remain elusive against the backdrop of differing interpretations and understandings proposed by doctrine and practice.¹¹ For purposes of the present analysis it suffices to focus on one specific feature that ship automation may engender: that vessels no longer carry an on-board crew, that they are ‘unmanned’.¹² As regards the technical capability of unmanned ships, they can be either remote-controlled or ‘intelligent’;¹³ and they vary in terms of scope of autonomy (the range of tasks that a system can perform autonomously, such as navigation, communication or mooring) and level of autonomy (how independently from human intervention the system may perform a given task).¹⁴

II. Unmanned ships as a (future) component of the commission and suppression of maritime crime

In 2020, headlines about innovations and successful trials on ship automation technology continued to proliferate, be it reports on the development of unmanned commercial tugboats commissioned by Abu Dhabi Ports,¹⁵ uncrewed ferries operating in Scandinavian countries,¹⁶ or the successful crossing of the Panama Canal by a vessel almost entirely without human assistance.¹⁷ As the success stories about autonomous maritime technology multiply, reports indicating its malicious uses have equally become more frequent. Among the most prominent incidents are the attacks by Houthi rebels against merchant ships, warships and installations in the Red Sea using remote-controlled, explosive-laden boats, which have been ongoing since early 2017.¹⁸

At times, however, the term ‘autonomous’ is reserved to refer to ships featuring the highest degree of automation; see, e.g., Bureau Veritas, *Guidelines for Autonomous Shipping* (October 2019) sec 1.4.3.

¹¹ For an overview on various definitions: Bradley Martin and others, *Advancing Autonomous Systems: An Analysis of Current and Future Technology for Unmanned Maritime Vehicles* (Rand Corporation, 2019) 5-7.

¹² This chapter solely focuses on ships without any persons on board; yet it is acknowledged that legal issues may already arise if ship automation technology allows the operation of a ship with a reduced crew (see, e.g., International Maritime Organization ‘Summary of Main Gaps and Common Themes in Instruments Under the Purview of the Legal Committee’ (10 January 2020) IMO Doc LEG 107/8/17, para 7, on the question of who has to satisfy the role of the master in cases of a partially automated vessel with limited crew on board.

¹³ On technical capability, see Henrik Ringbom and Felix Collin, ‘Terminology and Concepts’ in Henrik Ringbom, Erik Røsæg and Trond Solvang (eds), *Autonomous Ships and the Law* (Routledge 2021) 9-11.

¹⁴ On autonomy, see Henrik Ringbom and Felix Collin, ‘Terminology and Concepts’ in Henrik Ringbom, Erik Røsæg and Trond Solvang (eds), *Autonomous Ships and the Law* (Routledge 2021) 12-15.

¹⁵ Marcus Hand, ‘Abu Dhabi Ports to develop unmanned autonomous tugs with Robert Allan’ (*Seatrade Maritime News*, 4 March 2020) <www.seatrade-maritime.com/technology/abu-dhabi-ports-develop-unmanned-autonomous-tugs-robert-allan> accessed 15 February 2021.

¹⁶ E.g., Malcolm Latache, ‘Automatic Ferry First Claimed by Kongsberg’ (*ShipInsight*, 13 February 2020) <<https://shipinsight.com/articles/automatic-ferry-first-claimed-by-kongsberg>> accessed 15 February 2021.

¹⁷ David Hambling, ‘US Navy’s huge uncrewed robot ship has journeyed through Panama Canal’ (*NewScientist*, 18 November 2020) <www.newscientist.com/article/2260008-us-navys-huge-uncrewed-robot-ship-has-journeyed-through-panama-canal/> accessed 15 February 2021.

¹⁸ H I Sutton, ‘Disguised Explosive Boat May be New Threat to Tankers Off Yemen’ (*Forbes*, 4 March 2020) <www.forbes.com/sites/hisutton/2020/03/04/new-disguised-explosive-boat-may-threaten-tankers-off-

Remote-controlled ships have also been used to smuggle narcotics, notably in the Adriatic Sea, a development that ‘may drastically change the threat profile’.¹⁹ Autonomy has thus opened up new avenues for those intent on compromising maritime security, while drastically reducing the risks associated with such criminal endeavours. The latter holds true notably because the use of remotely operated offender ships provides ample distance from the actual scene of the crime, which minimizes the perpetrator’s risk of being killed, injured or arrested, and complicates attribution of criminal conduct.²⁰ In all likelihood, offenders will increasingly rely on this new technology in the future.²¹ While transnational crime is already a major maritime security concern today,²² unmanned offender ships may aggravate the state of lawlessness currently witnessed at sea.

At the same time, the use of autonomous systems and ships augments the capabilities, effectiveness and reach of those enforcing the law at sea at presumably reduced costs.²³ Thus, reliance on ‘aquatic, autonomous robots could reduce lawlessness at sea’.²⁴ It is against this background that coastguards, port state authorities and navies have started embracing autonomous systems for their operations, including law enforcement. Australia, for instance, ordered ‘uncrewed robot boats’ to patrol its waters, notably to detect boats transporting asylum seekers.²⁵ In the Pitcairn Island Marine Protected Area, the *Wave Glider*, a system powered by wave and solar energy, has been deployed to fight illegal, unreported and unregulated (IUU) fishing.²⁶ Similarly, the solar-powered craft *Daphne* equipped with surveillance technology will

yemen/?sh=669e89831ad2> accessed 15 February 2021; The National, ‘Saudi Arabia foils Houthi rebel attack on oil facility in Jizan’ (13 November 2020) <www.thenationalnews.com/world/mena/saudi-arabia-foils-houthi-rebel-attack-on-oil-facility-in-jizan-1.1110792> accessed 15 February 2021.

¹⁹ H I Sutton, ‘First narco-USV’ (23 June 2019) <www.hisutton.com/Otranto_unmanned-drug-vessel.html> accessed 15 February 2021.

²⁰ Joel Coito, ‘Maritime Autonomous Surface Ships: New Possibilities – and Challenges – in Ocean Law and Policy’ (2021) 97 *International Law Studies* 259, 289.

²¹ See, in general, Miles Brundage and others, *The Malicious Use of Artificial Intelligence: Forecasting, Prevention, and Mitigation* (Future of Humanity Institute, University of Oxford, 2018).

²² United Nations General Assembly ‘Annual Resolution on Oceans and the Law of the Sea’ (31 December 2020) UN Doc A/RES/75/239, preamble and para 155.

²³ US Department of the Navy, *Strategic Roadmap for Unmanned Systems (Short Version)* (29 May 2018) <<https://news.usni.org/2018/05/29/summary-department-navy-strategic-unmanned-systems-roadmap>> accessed 15 February 2021; on their advantages in counter-drug operations specifically, see Coito (n 20) 279–85.

²⁴ The Economist, ‘If Drones Ruled the Waves: Avast, me Hearties’ (7 July 2018) <www.economist.com/the-world-if/2018/07/07/avast-me-hearties> accessed 15 February 2021.

²⁵ David Hambling, ‘Australia will use robot boats to find asylum seekers at sea’ (*NewScientist*, 31 July 2020) <www.newscientist.com/article/2250406-australia-will-use-robot-boats-to-find-asylum-seekers-at-sea/#ixzz6XSEX76eq> accessed 15 February 2021.

²⁶ Liquid Robotics, ‘How Unmanned Surface Vehicles Can Shine Light on Dark Targets & Cue Assets for Inspection and Interdiction’, 3–6 <<https://cdn2.hubspot.net/hubfs/287872/website-downloads/LR-Shine-Light-On-Dark-Targets.pdf>> accessed 15 February 2021.

ultimately be used to ‘discern patterns of illegal fishing activity’.²⁷ The first fully-fledged autonomous enforcement crafts recently appeared on the market;²⁸ and, in late summer 2020, the United States Coast Guard ‘selected Metal Shark and Sea Machines to supply an autonomous test vessel’ to its Research and Development Center.²⁹ At present, unmanned vessels largely provide support to manned crafts; yet experts believe they will soon be undertaking their own missions, either alone or as a group.³⁰ Considering these developments, ship automation can hardly be considered a technology of passing interest;³¹ rather, it will gradually become an integral part of both the commission and suppression of maritime crime.³²

III. The notion of ‘ship’ in UNCLOS and the absence of persons on board

Many provisions of the UNCLOS – including those which together form the legal framework to prevent and suppress maritime crime – refer to ships or, interchangeably, to vessels.³³ It is therefore only natural to ask whether unmanned crafts, which do not carry an on-board crew, qualify as ‘ships’ in the sense of these provisions. In other words, does the absence of persons aboard matter vis-à-vis the concept of ‘ship’ in the meaning of said provisions? What link, if any, between the person – traditionally assumed to be on board – and the craft and/or the flag state is necessary to have a ‘ship’ as referred to in a multitude of provisions of the UNCLOS?

Such analysis presupposes, in a first step, to disentangle the notion of ‘ship’. Reading through the Convention, it quickly becomes apparent that the term is a multidimensional one: it is used to denote moveable property, but also as a cipher for the flag state and individuals.³⁴ As the UNCLOS attaches rights and obligations to ‘ships’, the determination whether the notion connotes a chattel, a state or a human being in a given provision goes beyond a purely academic

²⁷ Vanessa Minke-Martin, ‘RoboCop Sets Sail’ (*Hakai Magazine*, 18 November 2020) <www.hakaimagazine.com/news/robocop-sets-sail/> accessed 15 February 2021.

²⁸ Josh Stickles, ‘Metal Shark and Sea Machines Launch New Sharktech Autonomous Vessel’ (24 September 2019) <www.metalsharkboats.com/september-24th-2019-metal-shark-and-sea-machines-launch-new-sharktech-autonomous-vessel/> accessed 15 February 2021.

²⁹ Greg Trauthwein, ‘Top Maritime Trends of 2020: Autonomy’ (*MarineLink*, 15 December 2020) <www.marinelink.com/news/top-maritime-trends-autonomy-483918> accessed 15 February 2021.

³⁰ Ilaria Grasso Macola, ‘Autonomous Security Vessels: Benefits, Challenges and Future Uses’ (25 August 2020) <https://ship.nridigital.com/ship_sep20/autonomous_security_vessels> accessed 15 February 2021.

³¹ Aldo Chircop, ‘Testing International Legal Regimes: The Advent of Automated Commercial Vessels’ (2018) 60 *German Yearbook of International Law* 1, 4.

³² On criminals as ‘early adopters’ of new technologies, see Marc Goodman, *Future Crimes: Inside the Digital Underground and the Battle for our Connected World* (Corgi Books 2015) 12.

³³ 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* (Martinus Nijhoff 2012) 56; exceptionally, the term ‘boat’ appears in the convention, see Articles 110(2) and 111(1) and (4) UNCLOS.

³⁴ Meyers (n 1) 8 and 352.

exercise and has far-reaching implications at the level of both substantive and procedural law.³⁵ Yet, for various provisions of the UNCLOS, the answer as to which dimension the term ‘ship’ connotes is fraught with uncertainty. Moreover, at times, the word ‘ship’ as used in a given UNCLOS provision may comprise more than one dimension.³⁶ Taking note of this, we now engage in a discussion – structured along the three meanings the word carries – whether a craft without persons aboard may qualify as a ‘ship’.

A. ‘Ship’ as moveable property

To begin with, in the law of the sea, including in the UNCLOS, the word ‘ship’ is used ‘as a generic name for a movable property which is suited for navigation’.³⁷ For example, when Article 110(1) UNCLOS provides that in specific cases ‘a foreign ship’ encountered on the high seas may be boarded, the term ‘may refer to movable property’.³⁸ Similarly, in Article 226(1)(a) UNCLOS, which limits the ‘physical inspection of a foreign vessel’ to ‘an examination of such certificates, records or other documents as the vessel is required to carry’, the term ‘ship’ equally designates a good. Discussions on whether autonomous watercrafts qualify as ‘ships’ pertain mainly to this dimension of the term.³⁹

It is a futile exercise seeking a generally valid answer to the question whether unmanned crafts are covered by the generic notion of ‘ship’ denoting moveable property; this is due to both the technology and the law. As regards the former, the range of ship automation technology in development and already in use is very broad.⁴⁰ While, for instance, the car ferry *Falco* cannot be distinguished from a conventional one from the outside,⁴¹ the *Wave Glider* has a

³⁵ Jin-Hyun Paik, ‘The Tribunal’s Jurisprudence and Its Contribution to the Rule of Law’ in The International Tribunal for the Law of the Sea (ed), *The Contribution of the International Tribunal for the Law of the Sea to the Rule of Law: 1996-2016* (Brill Nijhoff 2018) 64.

³⁶ Thus, views are split whether freedom of navigation – a primordial concept for the law of the sea – is solely a right of the flag states or also a right of persons; arguing for the latter *M/V ‘Saiga’ (No 2) (Saint Vincent and the Grenadines v Guinea)* (Merits, Judgement of 1 July 1999, Sep. Op. Wolfrum) ITLOS Reports 1999, 92, 109-10. See also below n 62 on who holds the right to compensation in cases of unjustified interference with freedom of navigation.

³⁷ Meyers (n 1) 8.

³⁸ Paik (n 35) 64.

³⁹ See, e.g., the analysis by James Kraska, ‘The Law of Unmanned Naval Systems in War and Peace’ (2010) 5(3) *The Journal of Ocean Technology* 44, 51-53; Robert Veal and Michael Tsimplis, ‘The Integration of Unmanned Ships into the *Lex Maritima*’ [2017] *Lloyd’s Maritime & Commercial Law Quarterly* 303, 308-09; and Van Hooydonk (n 8) 406-09.

⁴⁰ Stating the same in the context of conventional ships: Noyes (n 33) 56.

⁴¹ For the very reason that the 53.8-meter *Falco* is a traditional ship that entered in service with *Finferries* in 1993; it has only recently been equipped with ship automation technology: Rolls Royce, ‘Rolls-Royce and Finferries Demonstrate World’s First Fully Autonomous Ferry’ (Press Release, 3 December 2018) <www.rolls-

closer resemblance to a surfboard than what one deems a vessel.⁴² In terms of an on-board crew specifically, some crafts are of such size that they could carry persons, others not. Moreover, from an operational perspective, a specific type of unmanned craft may be used for various tasks and activities.⁴³ The second reason why the question whether unmanned watercrafts are ships defies ‘a single “yes” or “no” answer’⁴⁴ is found in the law. The notion of ‘ship’ or ‘vessel’ appears in many different provisions of the UNCLOS, each of which regulates different aspects belonging to different subject matters. Each provision thus pursues a distinct purpose and fulfils a distinct function.⁴⁵ As a result, the assessment has to be undertaken on a case-by-case basis.⁴⁶

To be sure, all the UNCLOS provisions containing a reference to ‘ships’ were drafted based on the assumption that vessels carry an on-board crew. Yet, in some cases it is easier to accommodate the absence of persons aboard, which the turn to unmanned crafts heralds, than it is in others. The definition of piracy, which refers to two types of ships, is paradigmatic in this respect: while it seems irrelevant whether the victim vessel is manned or unmanned, it may matter for the offender craft. Article 101(a)(i) UNCLOS requires the harmful conduct to be directed ‘against another ship ... *or* against persons *or* property on board such ship’.⁴⁷ Not only does the definition dissociate three alternative targets of a pirate attack,⁴⁸ but the word ‘depredation’ also implies that causing harm to moveable property alone – the ship or any type of chattel on board – is sufficient to amount to an interference with freedom of navigation that the provision seeks to prevent and repress.⁴⁹ It thus seems tenable to argue that unmanned crafts may constitute a victim ship in the sense of UNCLOS’ piracy definition. This is somewhat more difficult to claim for offender ships given the provision’s explicit reference to persons. Concretely, it requires that the harmful act is ‘committed ... by the crew or the passengers of a private ship’. While a ‘passenger’ has, perforce, to be aboard the ship, the term ‘crew’ could be interpreted

royce.com/media/press-releases/2018/03-12-2018-rr-and-finferries-demonstrate-worlds-first-fully-autonomous-ferry.aspx> accessed 15 February 2021.

⁴² The three-meter-long *Wave Glider*, which can be operated individually or in fleets is designed to deliver real-time data; the maximum mission duration is up to one year: Liquid Robotics, ‘Wave Glider Spec Sheet’ <www.liquid-robotics.com/wave-glider/how-it-works/> accessed 15 February 2021.

⁴³ Van Hooydonk (n 8) 404; Allen (n 7) 493.

⁴⁴ Allen (n 7) 493.

⁴⁵ Daniel P O’Connell, *The International Law of the Sea, Volume II* (Ivan A Shearer ed, Clarendon Press 1984) 748; Noyes (n 33) 57.

⁴⁶ Similar: Natalie Klein, ‘Maritime Autonomous Vehicles within the International Law Framework to Enhance Maritime Security’ (2019) 95 *International Law Studies* 244, 251.

⁴⁷ Article 101(a)(i) UNCLOS (emphasis added).

⁴⁸ As per Tim R Salomon, *Die internationale Strafverfolgung gegenüber somalischen Piraten* (Springer 2017) 124-25, attacks against property on board, which do not cause harm to crew or passengers, qualify as piracy (provided the remaining definitional elements are fulfilled).

⁴⁹ See Salomon (n 48) 127.

as covering a remote crew – at least if the perpetrators use remote-controlled crafts, thus exercising contemporaneous control over the device causing harm at sea.⁵⁰ By contrast, the link between the offender and the ship is much looser if the former relies on an ‘intelligent’ craft capable of making decisions and determining action by itself while *en route*. In such a case, whether there is a ‘crew ... of a private ship’ will have to be examined in more detail.

Similar interpretative challenges arise in the context of norms that define vessels authorized to enforce the law at sea. References in the UNCLOS to government vessels or warships can connote any of the three meanings of the term ‘ship’: moveable property, which is discussed here; law enforcement officials on board ships authorized to enforce the law, which the entire Convention does not mention one single time explicitly;⁵¹ and also the state enforcing the law.⁵² In the context of ships authorized to enforce the law, the absence of an on-board crew is particularly challenging as regards the (demanding) definition of ‘warship’ comprised in Article 29 UNCLOS.⁵³ It not only stipulates that a warship be ‘under the command of an officer’, but, moreover, requires it to be ‘manned by a crew which is under regular armed forces discipline’. The discussion of these elements conducted elsewhere⁵⁴ shall not be replicated here. Rather, the reference to the debate serves to underline the need to further clarify the link that must exist between the unmanned craft and the person remotely fulfilling some or all tasks traditionally performed on board for an unmanned craft to qualify as ‘ship’ or ‘warship’. In doing so, it is essential to unpack the underlying function of a given requirement stipulated in the UNCLOS and to read it in light of the object and purpose of the treaty, which ‘[i]n its most general sense ... promotes the rule of law at sea by allocating authority to govern and by imposing

⁵⁰ For a detailed analysis, preceded by a discussion on the appropriate interpretative approach, see Anna Petrig, ‘The Commission of Maritime Crimes with Unmanned Systems: An Interpretive Challenge for the United Nations Convention on the Law of the Sea’ in Malcom D Evans and Sofia Galani (eds), *Maritime Security and the Law of the Sea: Help or Hindrance?* (Edward Elgar Publishing 2020) 123-30.

⁵¹ The only mention of ‘officials’ in the entire Convention can be found in Article 224 UNCLOS. Yet, the provision mentions officials and warships/government ships in the alternative; from the context accrues that the term ‘officials’ denotes persons enforcing the law against ships lying in port or at an offshore terminal in the context of port state control (see Vasco Becker-Weinberg, ‘Article 224’, in Alexander Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck 2017) 1533) and not to ‘officials’ aboard ships authorized to enforce the law.

⁵² Some provisions designate the ‘State’ (rather than a warship or a state craft) as the relevant actor; see, e.g., Articles 105 and 106 UNCLOS referring to the state carrying out a seizure.

⁵³ What follows is based on a scenario where the unmanned system cannot be considered an integral part of a warship and, thus, sharing the latter’s legal status; on the so-called ‘component theory’, see Kara Chadwick, ‘Unmanned Maritime Systems Will Shape the Future of Naval Operations: Is International Law Ready?’ in Malcom D Evans and Sofia Galani (eds), *Maritime Security and the Law of the Sea: Help or Hindrance?* (Edward Elgar Publishing 2020) 142 and 144.

⁵⁴ See, e.g., Chadwick (n 53) 143-46; Histoshi Nasu and David Letts, ‘The Legal Characterization of Lethal Autonomous Maritime Systems: Warship, Torpedo, or Naval Mine?’ (2020) 96 *International Law Studies* 79, 84-86.

qualifications on that authority in different situations'.⁵⁵ The function of the requirement in Article 29 UNCLOS relating to military command and crewing, for instance, is 'to limit the exercise of belligerent rights to members of the regular armed forces responsible to the flag State';⁵⁶ and – more generally and beyond the context of naval warfare – to ensure 'it was not a private vessel' interfering with another ship.⁵⁷ At the current juncture, views are split on whether this purpose can be realized if command and crew are ashore rather than aboard the craft.⁵⁸ Again, a case-by-case analysis, taking into account the technology and the law is in order.

This cursory discussion reveals that even for the determination of whether an unmanned craft qualifies as a 'ship' in the sense of moveable property, the expectation of human presence, which colours the norms of UNCLOS in many ways, has a bearing. Moreover, it underlines that the qualification of an unmanned device as a 'ship' not only hinges upon the specific (type of) craft and how it is used, but also on the provision of the UNCLOS under scrutiny.

B. 'Ship' as a cipher for the flag State

As mentioned in the introduction, the term 'ship' is multi-dimensional in the law of the sea and used to designate more than simply moveable property. O'Connell has rightly observed that a ship 'is for some purposes ... a chattel, but it is not only a chattel, because it has the capacity to carry with it the law and jurisdiction of sovereigns'.⁵⁹ Indeed, qua nationality, a unique jurisdictional link between the ship and a state (the 'flag state') is established.⁶⁰ The connection is so tight that the UNCLOS, at times, uses the word 'ship' as a cipher for the flag state. If, for instance, 'it is stated in a certain context that a ship has a given right, the meaning is often that the flag state of the ship has the right in question'.⁶¹

⁵⁵ Bernard H Oxman, 'Human Rights and the United Nations Convention on the Law of the Sea' (1998) 36 *Columbia Journal of International Law* 399, 402.

⁵⁶ Wolff Heintschel von Heinegg, 'Warships' *Max Planck Encyclopedia of Public International Law* (last updated October 2015) <<https://opil.ouplaw.com/home/mpi>> para 16.

⁵⁷ McKenzie (n 7) 30.

⁵⁸ As per McKenzie (n 7) 31, the warship definition 'appears to require the presence of a military officer and crew on the vessel'; tending towards the same conclusion: Rob McLaughlin, 'Unmanned Naval Vehicles at Sea: USVs, UUVs, And the Adequacy of the Law' (2011) 21 *Journal of Law, Information and Science* 100, 109-10; as per Heintschel von Heinegg (n 56) para 16, an unmanned craft 'could be considered warships if the persons remotely operating or controlling them are subjected to regular armed forces discipline'.

⁵⁹ O'Connell (n 45) 747.

⁶⁰ O'Connell (n 45) 752.

⁶¹ Meyers (n 1) 352 (on the law of the sea in general).

As regards the law enforcement context, the norms governing the consequences of an unjustified interference with freedom of navigation exemplify that the term ‘ship’ is occasionally used as a shortcut to refer to the flag state. Whereas Article 106 UNCLOS explicitly stipulates that a state that engaged in a seizure without adequate grounds ‘shall be liable to the State the nationality of which is possessed by the ship’, Article 110(3) UNCLOS governing unjust boarding – a less intrusive measure compared with seizure – provides that the ‘ship’ must be compensated. Article 111(8) UNCLOS, foreseeing compensation in the event of a wrongful exercise of the right of hot pursuit, equally refers to the ‘ship’. It is arguable that the term ‘ship’ in the latter two provisions designates the flag state as the holder of the right to compensation.⁶²

The broader issue is thus whether unmanned ships can possess nationality, by which they become jurisdictionally connected with the flag state. Only in this case, the flag state is the holder of specific rights that the UNCLOS confers to ‘ships’ – used as a reference to the state of nationality of the vessel. Various commentators explicitly assert,⁶³ or at least implicitly assume,⁶⁴ that unmanned crafts must possess nationality – for they would otherwise float in a legal vacuum on the high seas, which are not subject to any national jurisdiction or centralised authority.⁶⁵ Still, a series of aspects require further scrutiny.

As regards the suppression of crimes committed either on board, from on board or through the use of a vessel, it is essential to discuss the impact that the turn to unmanned ships may have on the operation and effectiveness of the flag state principle. In the context of traditional ships, it goes without saying that the jurisdiction of the flag state extends to both the ship as moveable property *and* the persons on board.⁶⁶ The flag state has full prescriptive and, as a general rule,

⁶² It is not discussed here whether the term ‘ship’ refers to individuals – either in addition to the flag state or exclusively. To maintain the latter is arguably difficult considering the explicit reference to the flag state in Article 106 UNCLOS; for an in-depth discussion of this issue, see Philipp Wendel, *State Responsibility for Interferences with the Freedom of Navigation in Public International Law* (Springer 2007) 67-112. On the fact that for various provisions of the UNCLOS it remains unclear which dimension the term ‘ship’ connotes, see text belonging to n 35-36.

⁶³ E.g., Van Hooydonk (n 8) 409.

⁶⁴ See, e.g., Chircop (n 31) 11-15 discussing flag state rights and duties in relation to unmanned ships.

⁶⁵ Yoshifumi Tanaka, *The International Law of the Sea* (3rd edn, CUP 2019) 190.

⁶⁶ As per Article 94(2)(b) UNCLOS every flag state shall ‘assume jurisdiction ... over each ship flying its flag and its master, officers and crew’.

exclusive enforcement jurisdiction over persons aboard,⁶⁷ notably over the master⁶⁸ who is the prime attribution subject when it comes to criminal liability for offences involving a ship under his or her command.⁶⁹

If we contrast this situation with that involving the use of unmanned ships, the following picture emerges.⁷⁰ As tasks traditionally incumbent on the on-board crew can theoretically be performed from any place on the globe. As a consequence, the person in control of the vessel, and thus in a position to use it in illicit ways (say, the shore-based vessel controller), can equally be anywhere in the world. If that person is located in the *territory of the flag state*, they continue to be under its full prescriptive and exclusive enforcement jurisdiction – like the master and crew on board a conventional ship, but this time based on the territoriality rather than flag state principle. If, however, the person acts from the *territory of a third state*, the flag state's 'jurisdictional grip' over that person is much looser. First of all, as regards prescriptive jurisdiction, the reach of the flag state's domestic law is, as a general rule, limited to its own territory and ships. While nationality is, in addition to the territoriality and flag state principles, a recognized connecting factor, it does not allow for the wholesale applicability of a state's law to its nationals abroad. Indeed, practice demonstrates that states exercise restraint and only exceptionally apply their rules to nationals who are not in their territory or on board their ships.⁷¹ What is

⁶⁷ The word 'full' is used to indicate that the flag state can regulate *all* issues aboard a ship, but other states may – e.g., based on the nationality of a person aboard (see below n 71) – in parallel be competent to regulate *specific* issues in relation to that person; the term 'exclusive', by contrast, means that the flag state is, as a general rule, the *only* state competent to enforce the law. Arguing that only enforcement jurisdiction is exclusive: Douglas Guilfoyle, 'Article 92' in Alexander Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck 2017) 700-01.

⁶⁸ John Cartner, Richard Fiske and Tara Leiter, *The International Law of the Shipmaster* (Informa Law 2009) 95.

⁶⁹ At times even in constellations where the 'real responsibility ... may well lie elsewhere': Alla Pozdnakova, *Criminal Jurisdiction over Perpetrators of Ship-Source Pollution* (Martinus Nijhoff 2012) 2.

⁷⁰ Similar to warships (see above n 54), the following is based on the scenario where the unmanned craft does *not* belong to a conventional ship with which it shares legal status. In the proceedings involving a German-flagged ship from which a robot was sent to the wreck of the Estonia to take footage, it appears that the court brought the entire fact pattern within the reach of the flag state principle: see Jon Henley, 'Swedish film-makers cleared of desecrating Estonia ferry wreck site' (*The Guardian*, 8 February 2021) <www.theguardian.com/world/2021/feb/08/swedish-court-clears-two-film-makers-over-footage-of-estonia-ferry> accessed 15 February 2015.

⁷¹ They exceptionally do so, e.g., to prohibit serious offences: Christopher Staker, 'Jurisdiction' in Malcom D Evans (ed), *International Law* (5th edn, OUP 2018) 300. True, in some states a trend to widen criminal jurisdiction based on the active personality principle can be observed (see, e.g., Thomas Elholm and Birgit Feldtmann, 'Nordic Trends of Jurisdiction: An International Perspective' in Thomas Elholm and Birgit Feldtmann (eds), *Criminal Jurisdiction: A Nordic Perspective* (Djøf Publishing 2014) 152); however, the principle still covers comparatively few offences. Against this background, the statement by Eliana Silva Pereira (author) and Marta Chantal Ribeiro (coordinator), *Unmanned Vessels & Unmanned Maritime Vehicles: Prospects of a Legal Framework in the International and the Portuguese Context* (CIIMAR, 2019) 52, that 'shore-based masters and crew can always be subject to the jurisdiction of the State of nationality' is arguably too sweeping. Moreover, as we will see below (text

more, it will arguably be a rare occurrence that the person in charge of the unmanned vessel possesses the nationality of the flag state; in the context of conventional ships, at least, the nationality of the ship does not necessarily correspond to the nationality of the master given that only a handful of states together supply the lion's share of officers.⁷² Second, the flag state is prevented from enforcing its law outside its territory 'except by virtue of a permissive rule derived from international custom or from a convention'.⁷³ Overall, in situations where the person in control of the unmanned vessel is located in a third state rather than the flag state, jurisdiction is bifurcated. Over the 'ship' as moveable property, the flag state has full prescriptive and exclusive enforcement jurisdiction qua flag state principle. Over the person in control of the unmanned ship who is abroad, by contrast, the flag state has only very exceptionally and in limited instances prescriptive jurisdiction, and it is not allowed to enforce its law against that person on foreign territory unless the territorial state consents.

This is one of the reasons why the connection between the flag state and the 'master' of an unmanned ship deserves more attention⁷⁴ in the discussion of the nationality and registration of this new type of vessel. How can it be ensured that the flag state has jurisdiction not only over moveable property, but also over persons in control of the unmanned vessel? Is it, for example, by conditioning the attribution of nationality to an unmanned ship upon the presence of its 'master' within the flag state when operating the ship?⁷⁵ This seems *prima vista* not to align well with international law, specifically Article 91(1) UNCLOS entitling each state to fix the conditions for the grant of nationality. Yet, this right has never been without limitations.⁷⁶ First

relating to n 78-82), Article 94 UNCLOS requires that the flag state exercises its jurisdiction over both the vessel and persons aboard.

⁷² See International Chamber of Shipping, 'Shipping and World Trade: Global Supply and Demand for Seafarers' <www.ics-shipping.org/shipping-fact/shipping-and-world-trade-global-supply-and-demand-for-seafarers> accessed 15 February 2021).

⁷³ *The Case of the S.S. 'Lotus' (France v Turkey)* (Merits) PCIJ Rep Series A No 10, 18-19. Even if such permission is available, the flag state will rather seek extradition of the suspect, yet the procedure is time-consuming and not necessarily always promising; see Neil Boister, *An Introduction to Transnational Criminal Law* (2nd edn, OUP 2018) 353-56.

⁷⁴ Whether the jurisdiction of the flag state extends to persons *not on board* the ship has already been discussed previously (see, e.g., Meyers (n 1) 8-9), yet the focus was on figures such as the operator or owner of the ship rather than the master or crew – as they have been assumed to be on board.

⁷⁵ This presupposes that there is a functional equivalent of a master involved in the operation of the unmanned ship – what is arguably not the case if it features a very high degree of autonomy. Veal and Tsimplis (n 39) 317-19 argue that if the master is not defined 'by reference to the individual's on onboard attendance but instead by reference to his hierarchical position in respect of the ship's navigation and, more particularly, his position at the top of it', a shore-based remote controller can be qualified as a master; however, if the ship is pre-programmed for a specific voyage and the person on shore has no 'contemporaneous influence' and overriding power over it, his or her quality as a master is doubtful.

⁷⁶ Doris König, 'Flags of Ships' *Max Planck Encyclopedia of Public International Law* (last updated April 2009) <<https://opil.ouplaw.com/home/mpi>> para 21.

of all, the very same provision requires that ‘[t]here must exist a genuine link between the State and the ship’. True, the genuine link concept is not interpreted as comprising material criteria that a state must observe when granting nationality to ships; but it serves the purpose ‘to secure more effective implementation of the duties of the flag State’.⁷⁷ Article 94 UNCLOS elaborates on these duties and stipulates that the flag state shall ‘effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag’⁷⁸ and, in particular, ‘assume jurisdiction under its internal law over each ship flying its flag *and* its master, officers and crew’.⁷⁹ Moreover, it requires that ‘each ship is in the charge of a master ... who possess[es] appropriate qualifications’.⁸⁰ It is difficult to see how a flag state can live up to these duties if the person controlling an unmanned ship is *not* in its territory and thus *not* subject to its full prescriptive and exclusive enforcement jurisdiction.⁸¹ On what basis could the rules of State A, for instance regarding the appropriate qualification of the master, be made applicable (let alone enforceable) to a shore-based controller located in State B?⁸²

Considering the foregoing, it seems that in the realm of unmanned ships, the need to equip the ‘genuine link’ concept with a substantive dimension is even more pressing than in the context of conventional ships. Even though various flag states – especially those issuing so-called ‘flags of convenience’ – are known for their lax enforcement practices,⁸³ legally speaking they possess jurisdiction over the ship *and* the persons on board, which is not necessarily the case for unmanned ships for the reasons explained above. If the ship’s nationality is not predicated on a truly genuine connection between the person in control of the unmanned ship and the flag state, the risk is that the genuine link ‘would then be virtual in the highest degree’ in the era of autonomy.⁸⁴

⁷⁷ *M/V ‘Saiga’ (No 2) (Saint Vincent and the Grenadines v Guinea)* (Merits, Judgement of 1 July 1999) ITLOS Reports 1999, 10, 42.

⁷⁸ Para 1.

⁷⁹ Para 2(b), emphasis added.

⁸⁰ Para 4(b); whether unmanned ships can have a master, see above n 75.

⁸¹ See above text relating to n 70-73. It is at times argued that since unmanned ships will have a shipowner, the genuine link requirement would be fulfilled (see, e.g., Danish Maritime Authority, *Analysis of Regulatory Barriers to the Use of Autonomous Ships: Final Report* (December 2017) 39). As the *master* is the primary attribution subject for criminal conduct involving ships under the law as in force today (see above n 69), it is difficult to see how the shipowner’s link to the flag state can offset the enforcement and liability gap arising in the situation where the person in charge of the unmanned vessel is not in the territory of the flag state.

⁸² For the reasons set out above in text relating to n 71.

⁸³ Robin R Churchill and Alan V Lowe, *The Law of the Sea* (2nd edn, Manchester University Press 1988) 206.

⁸⁴ Van Hooydonk (n 8) 410.

C. ‘Ship’ to denote persons on board

When alluding to the usage that a master may refer ‘to himself at sea as the ship by name when talking with others’, Cartner, Fiske and Leitner gauge this as ‘merely seagoing argot’ with ‘limited legal value’.⁸⁵ Using the ship’s name instead of the master’s may indeed have no legal implications, yet it testifies to the almost symbiotic relationship between the master and the ship in a traditional shipping context. The idea that the master is closely and physically connected to their vessel – and, more broadly speaking, that ships are manned – is the main reason why the drafters of the UNCLOS did not deem it necessary to always distinguish carefully between the ship and persons aboard. Indeed, reading through the Convention, it is striking that the text not only lacks a part specifically dedicated to people at sea, but that many of its provisions refer to ships even where it is obvious that persons engage in the referenced conduct.

Along these lines, numerous provisions of Part VII of the UNCLOS refer to *ships* engaging in prohibited activity – rather than *persons*. By way of example, Article 110(1)(a) UNCLOS, prohibits boarding ‘unless there is reasonable ground for suspecting that ... the *ship* is engaged in piracy’.⁸⁶ In similar fashion, Article 111(1) UNCLOS authorizes hot pursuit if there is ‘good reason to believe that the *ship* has violated the laws or regulations’ of the coastal state.⁸⁷ Like wording can also be found in other sections of the treaty, such as Part XII on the protection and preservation of the marine environment. In that same vein, Article 220(5) UNCLOS makes the exercise of enforcement powers conditional upon the existence of ‘clear grounds for believing that a *vessel* ... has ... committed a violation’ relating to vessel-source pollution.⁸⁸ Likewise, Article 230(1) UNCLOS stipulates that only monetary penalties may be imposed for violations of rules pertaining to the prevention, reduction and control of pollution of the marine environment ‘committed by foreign *vessels*’.⁸⁹ This drafting technique seems particularly odd in the present context, where provisions pertain to illegal activity at sea; after all, the commission of crimes is intrinsically and intimately associated with human conduct⁹⁰ – at least so far.

⁸⁵ Cartner, Fiske and Leitner (n 68) 87.

⁸⁶ Emphasis added.

⁸⁷ Emphasis added.

⁸⁸ Emphasis added.

⁸⁹ Emphasis added.

⁹⁰ Susanne Beck, ‘Die Diffusion strafrechtlicher Verantwortlichkeit durch Digitalisierung und Lernende Systeme’ (2020) 15(2) Zeitschrift für Internationale Strafrechtsdogmatik 41, 45.

While there is agreement that one can ‘even read “ship” in UNCLOS to refer, at times, to individuals’,⁹¹ it is often less clear which categories of persons are referenced in a particular provision. Meyers encapsulates this in the somewhat strange sounding question ‘who are “a ship”?’⁹² The bottom line is that the reference to ‘ships’ does not ‘invariably [refer] to the same persons or group of persons’;⁹³ and that it is only through interpretation of a specific treaty or norm that the circle of persons it encompasses can be discerned. In some instances, the term ‘ship’ is used broadly in the law of the sea and maritime law ‘as a collective noun for designating particular persons *who have an interest* in that movable property’.⁹⁴ Even in a traditional setting, the word ‘ship’ may then encompass persons who are *not* on board the vessel, such as the shipowner.⁹⁵ Oftentimes, however, the word ‘ship’ is used in a much narrower fashion to only cover persons who are on board – that is, to refer ‘to the group of individuals employing the ship *for maritime navigation*’.⁹⁶ So far, those who commit offences on board a ship, from on board a ship or through the use of a ship fall in this narrower circle of persons that only comprises persons on board the vessel. The use of unmanned ships, however, allows the commission of maritime offences without a person being on board the offender craft; this begs the question whether norms referring to illegal activity of ships – until recently understood as a synonym for perpetrators on board the ship in question – continue to be applicable and relevant. Thereby, an essential question is whether the offences that are dealt with in the UNCLOS can be committed by relying on an unmanned rather than manned ship.

When seeking to answer this question, it is important to remind oneself of the role the UNCLOS plays when it comes to offence definitions and how it interacts with other legal frameworks in this respect. First of all, it bears mentioning that the UNCLOS only very exceptionally defines the offences to which it attaches certain legal consequences – be it, for example, the authorization to take specific enforcement measures, a basis for adjudication or a duty to cooperate. The definitions of ‘piracy’ in Article 101 UNCLOS and ‘unauthorized broadcasting’ in Article 109(2) UNCLOS are unique in this regard. As a general rule, the UNCLOS does not define the offence itself, but simply contains a *renvoi* to offences defined externally. The external source can be one belonging to international law. Thereby, the *renvoi* may be explicit, as in

⁹¹ Noyes (n 33) 59.

⁹² Meyers (n 1) 11.

⁹³ Meyers (n 1) 11.

⁹⁴ Meyers (n 1) 8 (emphasis added).

⁹⁵ Meyers (n 1) 11 provides the example of Articles 3 and 4 of the 1919 Convention for the Unification of Certain Rules of Law with respect to Collisions between Vessels where the word ‘vessel’ would refer to the shipowner.

⁹⁶ Meyers (n 1) 352 (emphasis added).

Article 108(1) UNCLOS, which refers to ‘illicit traffic in narcotic drugs ... engaged in by ships ... contrary to international conventions’. Other provisions simply refer to specific conduct prohibited by international law without explicitly pointing to an external source. Thus, for instance, the UNCLOS does not define the notions of either ‘transport of slaves’⁹⁷ or ‘slave trade’⁹⁸ nor does it explicitly refer to an external source where such conduct is defined and prohibited; nonetheless, these provisions serve ‘as a link between the general law regarding the abolition of slavery and the law of the sea.’⁹⁹ The definitions of offences to which the UNCLOS attaches specific legal consequences may also be found in domestic law, primarily ‘laws and regulations’ of coastal or flag states.¹⁰⁰ Examples are provided by Article 73(1) UNCLOS granting the coastal state such enforcement powers ‘as may be necessary to ensure compliance with the laws and regulations adopted by it’ and Article 111(1) UNCLOS allowing hot pursuit only if there is, *inter alia*, ‘good reason to believe that the ship has violated the laws and regulations’ of the coastal state. Lastly, there are instances where the UNCLOS attaches legal consequences belonging to the realm of criminal law not to a specific offence, but rather to a fact pattern that may entail criminal liability. Thus, for example, Article 97(1) UNCLOS regulates which state has penal jurisdiction ‘[i]n the event of a collision or any other incident of navigation ... involving the penal ... responsibility of the master or of any other person in the service of the ship’.

This picture, albeit painted with a broad brush, reveals that the question whether offences triggering certain legal consequences under the UNCLOS can be committed by manned *and* unmanned ships is one that can only exceptionally be addressed by the Convention – as it only exceptionally defines these offences. As a general rule, the UNCLOS contains a *renvoi* to offences defined externally, be it in international or domestic law. Whether these externally defined offences can be committed by unmanned crafts is therefore an issue that cannot be addressed at the level of UNCLOS. Rather, it is one to be explored and ultimately decided in those fora and by those authorities under the auspices of which the respective rules were initially enacted. The related discussion at both the academic and policy levels has only recently

⁹⁷ Article 99 UNCLOS.

⁹⁸ Article 110(1)(b) UNCLOS.

⁹⁹ Myron H Nordquist, Satya N Nandan, Shabtai Rosenne (eds), *United Nations Convention on the Law of the Sea 1982: A Commentary, Volume III* (Martinus Nijhoff 1995) 180 (re Article 99 UNCLOS). On the definition in international law, see Douglas Guilfoyle, ‘Article 110’ in Alexander Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck 2017) 771.

¹⁰⁰ At times, the UNCLOS *requires* the adoption of domestic norms; see, e.g., Article 113 UNCLOS regarding submarine cables or Articles 207(1), 208(1) and 210(1) UNCLOS regarding different forms of pollution.

emerged and remains embryonic at the time of writing; yet it is gaining momentum. As regards the International Maritime Organization (IMO) specifically, the so-called Maritime Autonomous Surface Ships have, in the space of only a few years, become one of the main regulatory projects.¹⁰¹ Since 2019, the Organization has been conducting a Regulatory Scoping Exercise, during which more than 30 treaties adopted under the auspices of the IMO are scrutinized under the angle of their continued relevance and applicability in the age of autonomous ships. Among them are the four SUA instruments,¹⁰² which have maritime crimes at their core. In the context of their initial analysis, the question whether the offences defined in the four instruments can be committed by persons not on board a ship, ‘such as the remote operator, programmers, or others involved in deploying an offender vessel’, has been raised but not yet discussed in depth.¹⁰³ It is notable that as per the methodology applied in the Regulatory Scoping Exercise, it is stressed that UNCLOS ‘should not be considered at this point’.¹⁰⁴ An analysis of the UNCLOS as such would indeed be outside the competence of the IMO, but the potential re-interpretation or even amendment of rules comprised in the various IMO instruments will necessarily reverberate at the level of the UNCLOS – not least due to its *renvois* to external law.

IV. Conclusion

The foregoing analysis demonstrates that an enquiry into whether the UNCLOS will continue to work as a ‘system of regulation’, the overarching topic of the book at hand, is both an apt and timely undertaking in the age of autonomy. The focus of this chapter was narrow insofar as it centred on the impact that the absence of people on board has on the applicability and relevance of the UNCLOS provisions that pertain to maritime crime and reference ‘ships’. Still, it clearly accrues that unmanned ships, which challenge a basic assumption on which the UNCLOS is built – that vessels have people on board – cannot be accommodated in the Convention

¹⁰¹ Henrik Ringbom, ‘Developments, Challenges, and Prospects at the IMO’ (2021) in Henrik Ringbom, Erik Røsæg and Trond Solvang (eds), *Autonomous Ships and the Law* (Routledge 2021) 56.

¹⁰² Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation of 10 March 1988, 1678 UNTS 221 (1988 SUA Convention), amended by the 2005 Protocol to the 1988 Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation of 14 October 2005, IMO Doc. LEG/CONF.15/21 (2005 SUA Convention); Protocol to the Convention of 10 March 1988 for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms Located on the Continental Shelf of 10 March 1998, 1678 UNTS 201 (1988 Fixed Platforms Protocol); amended by the Protocol of 2005 to the Protocol for the Suppression of Unlawful Acts Against the Safety of Fixed Platforms Located on the Continental Shelf of 14 October 2005, IMO Doc. LEG/CONF.15/22 (2005 Fixed Platforms Protocol).

¹⁰³ See, e.g., for the 2005 SUA Convention: International Maritime Organization ‘Summary of results of the LEG regulatory scoping exercise for the Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, 2005’ (9 January 2020) IMO Doc LEG 107/8/6, para 8.

¹⁰⁴ IMO Doc LEG 106/WP.5, para 12.

without further ado. It has been demonstrated that some of these issues cannot be addressed at the level of the UNCLOS alone, as it holds true for offences defined outside the Convention to which, however, it attaches specific legal consequences. Other challenges can be met by affording old provisions of the UNCLOS with new meaning through interpretation. This will, for instance, often be an appropriate methodological tool to bring an unmanned craft within the notion of ‘ship’ connoting moveable property. Yet, some issues – notably those of a jurisdictional nature – can arguably not be solved through interpretation alone. In these cases, it remains to be seen how the UNCLOS’ continued viability can be ensured in the age of autonomy given that it is anathema to even propose its formal amendment.¹⁰⁵

¹⁰⁵ See Liesbeth Lijnzaad, ‘UNCLOS as a comprehensive convention for the oceans’, chapter XX of this book.