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Sea drones: warships or weapons? Legal status and implications

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Abstract

Rapid technological development of autonomous and unmanned systems has impacted all sectors of industry. Now, sea drones capable of delivering force – i.e., designed or equipped to cause injury or damage – are also transforming naval warfare. The tangible effects of their deployment are already witnessed in, for example, the international armed conflict between the Russian Federation and Ukraine in the Black Sea. Despite the ongoing use of sea drones during naval hostilities, however, their legal status, including related rights and obligations, remains unclear under both the law of the sea and international humanitarian law frameworks.

This article analyzes the legal classification of sea drones capable of projecting force, examining whether they qualify as warships under Article 29 of the

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United Nations Convention on the Law of the Sea (UNCLOS) or as means of warfare under Articles 35–36 of Additional Protocol I to the Geneva Conventions. It also discusses the legal implications, showing that the classification of sea drones is not just a theoretical exercise but carries significant legal and operational consequences during both war and peace, such as those relating to sovereign immunity, navigational rights and lawful targeting. The paper argues that, since unmanned sea drones cannot pass the warship test (i.e., the cumulative requirements under UNCLOS Article 29), they should be categorized as naval means of warfare; thus, sea drone regulation can be drawn from the regimes governing naval mines and torpedoes. In conclusion, the paper highlights that the classification of sea drones must also consider their humanitarian implications.

Keywords: sea drones, maritime drones, unmanned systems, autonomous systems, naval warfare.

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From technology to law: The case of sea drones

In the current era, technology plays a significant role in armed conflicts.[1] In 2022, the North Atlantic Treaty Organization (NATO) stated that technological primacy had a direct impact on battlefield success,[2] and highlighted both the positive and negative aspects of emerging and disruptive technologies (EDTs).[3] The Organization also underlined that EDTs not only alter the character of conflict but have also acquired greater strategic significance, thereby becoming the "key arenas of global competition".[4]

The ongoing developments in the naval warfare between the Russian Federation and Ukraine in the Black Sea since 2022 represent a primary example of how EDTs impact the dynamics of a conflict, creating naval asymmetry and raising ethical questions.[5] There are, undoubtedly, multiple examples of new technological solutions employed by these two States, but it is the Ukrainian sea drone attacks against Russian armed forces over the last few years that have garnered worldwide interest.

Based on incidents reported in publicly accessible sources, several significant engagements involving sea drones can be identified. Among these are the October 2022 Sevastopol attack, where Ukrainian sea drones are reported to have

1 Ajey Lele, "Defence and Disruptive Technologies", in Ajey Lele, *Disruptive Technologies for the Militaries and Security*, Smart Innovation, Systems and Technologies Series, Vol. 132, Springer, Singapore, 2019, p. 29.

2 NATO, *NATO 2022 Strategic Concept*, 2022, para. 17.

3 NATO broadly understands EDTs as encompassing artificial intelligence (AI), autonomous systems and quantum technology, among other advanced developments. NATO, "Emerging and Disruptive Technologies", 25 June 2025, available at: www.nato.int/en/what-we-do/deterrence-and-defence/emerging-and-disruptive-technologies (all internet references were accessed in March 2026).

4 NATO, above note 2.

5 Noel E. Sharkey, "The Evitability of Autonomous Robot Warfare", *International Review of the Red Cross*, Vol. 94, No. 886, 2012.

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damaged the Russian-flagged *Ivan Golubets* (Natya-class minesweeper) and the *Admiral Makarov* (frigate).[6] In 2024, Ukraine is reported to have launched a series of attacks deploying the MAGURA V5 (Maritime Autonomous Guard Unmanned Robotic Apparatus V-type) sea drone, resulting in the sinking of vessels such as the *Ivanovets* (Tarantul-III corvette), *Tsezar Kunikov* (landing ship) and *Sergey Kotov* (patrol ship).[7] In 2025, media reported the first-of-their-kind aerial shoot-downs of a Russian Mi-8 helicopter and a Su-30SM fighter jet by MAGURA types V5 and V7 respectively.[8]

A close examination of these developments reveals that sea drones not only shape the military landscape but also challenge the legal framework governing the conduct of hostilities during an international armed conflict. The deployment of sea drones raises multiple legal questions, but the most fundamental one relates to their legal status and categorization as either a warship or a means of warfare under the law of the sea and international humanitarian law (IHL), notably the law of naval warfare, and the different legal consequences of the two categorizations.

To explore this issue, the remainder of this paper proceeds as follows. The first section classifies sea drones under the "warship test" – i.e., it assesses their characteristics against the requirements derived from the definition of warship codified in Article 29 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS).[9] The second section explains the alternative legal classification of sea drones as a means of warfare under Articles 35–36 of Additional Protocol I to the Geneva Conventions (AP I).[10] The third section explains the legal consequences associated with classifying sea drones under one or the other category. In conclusion, it is argued that the warship crewing requirement, as outlined in UNCLOS Article 29, is not merely a technicality; it is a decisive factor that distinguishes a warship from a weapons system, and also carries significant implications for the humanitarian aspects of conflicts.

6 John Daly, "Ukraine Launches Unprecedented Drone Attack on Russian Black Sea Fleet's Sevastopol Headquarters", *Eurasia Daily Monitor*, Vol. 19, No. 166, 2022.

7 Tyler Self, "What the Sinking of the Russian Corvette Ivanovets Teaches", *Proceedings*, Vol. 150, No. 5, 2024; Paul Kirby, "Russian Landing Ship Caesar Kunikov sunk Off Crimea, says Ukraine", *BBC News*, 14 February 2024, available at: www.bbc.com/news/world-europe-68292602; Alisa Orlova and Kateryna Zakharchenko, "Ukraine-Built MAGURA V5 Naval Drones Sink Russian Patrol Ship", *Kyiv Post*, 5 March 2024, available at: www.kyivpost.com/post/29016.

8 "Russian Mi-8 Helicopter Shot Down with Missile from Ukrainian Sea Drone", *Defense Mirror*, 31 December 2024, available at: www.defensemirror.com/news/38510/Russian_Mi_8_Helicopter_Shot_Down_with_Missile_from_Ukrainian_Sea_Drone; H. I. Sutton, "World First: Ukrainian Maritime Drone Shoots Down Russian Flanker Jet", *Naval News*, 3 May 2025, available at: www.navalnews.com/naval-news/2025/05/world-first-ukrainian-maritime-drone-shoots-down-russian-flanker-jet/.

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

10 Protocol Additional (I) to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts, 1125 UNTS 3, 8 June 1977 (entered into force 7 December 1978) (AP I).

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What is a sea drone? A brief look at terminology

Given the novel nature of sea drones and their emerging status, there is no definition of a sea drone in either legal or technological terms. Before turning to the terminology used in the legal scholarship, it is therefore necessary to outline the basic technological categories within which sea drones are situated. An "unmanned system" is the broadest category and refers solely to the absence of humans on board. On the other hand, an "autonomous system" answers the question of who – i.e., a human or an artificial intelligence (AI) – undertakes decisions; thus, it describes the operational decision-making process.[11] A fully unmanned system may therefore be remotely operated and not autonomous,[12] and conversely, a fully autonomous one may still have humans on board, such as weapon operators or other personnel whose tasks are unrelated to operational decision-making. Naval systems are simply those used for military purposes at sea.[13]

The limited legal scholarship employs various terms such as "unmanned maritime systems",[14] "unmanned maritime vehicles",[15] "unmanned naval systems"[16] and "maritime autonomous vehicles".[17] Even though these terms are not fully synonymous, they describe overlapping categories that are (inconsistently) used in the literature to capture similar technologies. Most legal scholars address the broader phenomenon of drones in the context of land and aerial warfare, referring to them also as "autonomous weapons systems"[18] and "lethal autonomous weapons

11 Hualong Chen *et al.*, "From Automation System to Autonomous System: An Architecture Perspective", *Journal of Marine Science and Engineering*, Vol. 9, No. 6, 2021, pp. 3–5.

12 Barbara Stępień, "Can a Ship Be Its Own Captain? Safe Manning of Autonomous and Uncrewed Vessels", *Marine Policy*, Vol. 148, 2023, p. 2.

13 Wolff Heintschel Von Heinegg, "Naval Technologies", in William H. Boothby (ed.), *New Technologies and the Law in War and Peace*, Cambridge University Press, Cambridge, 2018, pp. 315–316.

14 Aníbal Matos *et al.*, "Unmanned Maritime Systems for Search and Rescue", in Geert De Cubber *et al.*, *Search and Rescue Robotics: From Theory to Practice*, InTech, Rijeka, 2017; Michael N. Schmitt and David S. Goddard, "International Law and the Military Use of Unmanned Maritime Systems", *International Review of the Red Cross*, Vol. 98, No. 902, 2016; James Kraska and Raul Pedrozo, "Unmanned Maritime Systems", in James Kraska and Raul Pedrozo (eds), *Disruptive Technology and the Law of Naval Warfare*, Oxford University Press, New York, 2022.

15 Yen-Chiang Chang, Chao Zhang and Nannan Wang, "The International Legal Status of the [*sic*] Unmanned Maritime Vehicles", *Marine Policy*, Vol. 113, 2020; James Kraska, "Sovereign Immunity of Unmanned Maritime Vehicles", in Natalie Klein, Douglas Guilfoyle, Md Saiful Karim and Rob McLaughlin (eds), *Maritime Autonomous Vehicles and International Law*, Routledge, London, 2024.

16 James Kraska, "The Law of Unmanned Naval Systems in War and Peace", *Journal of Ocean Technology*, Vol. 5, No. 3, 2010.

17 Natalie Klein, Douglas Guilfoyle, Md Saiful Karim and Rob McLaughlin, "Maritime Autonomous Vehicles: New Frontiers in the Law of the Sea", *International and Comparative Law Quarterly*, Vol. 69, No. 3, 2020.

18 Peter Asaro, "On Banning Autonomous Weapon Systems: Human Rights, Automation, and the Dehumanization of Lethal Decision-Making", *International Review of the Red Cross*, Vol. 94, No. 886, 2012; James G. Foy, "Autonomous Weapons Systems: Taking the Human Out of International Humanitarian Law", *Dalhousie Journal of Legal Studies*, Vol. 23, 2014; Daniel N. Hammond, "Autonomous Weapons and the Problem of State Accountability", *Chicago Journal of International Law*, Vol. 15, No. 2, 2015; Marcin Marcinko, "Do Autonomous Weapon Systems Need Specific Rules of Engagement?", *Międzynarodowe Prawo Humanitarne*, Vol. 14, 2023.

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systems".[19] In a naval context, the concept of "lethal autonomous maritime systems" has also appeared.[20] Terms such as "sea drones" and "maritime drones" are often used interchangeably to describe a comparable kind of machine, usually referring to military technology.[21] This article focuses on the deployment of sea drones in warfare, leaving aside their use in civil and commercial contexts.[22]

For these reasons, given the lack of a widely accepted definition in a military context, a sea drone will be understood here as a machine operating in a maritime environment, equipped with a system that allows it to operate with limited or no human involvement in the decision-making process (human-in/-on/-off-the-loop),[23] and without human presence on board (unmanned/uncrewed).

This definition encompasses systems with varying degrees of autonomy. A sea drone may be fully autonomous in the decision-making process (human-off-the-loop),[24] may operate with human oversight over autonomous decisions, where a human enjoys veto power (human-on-the-loop), or may be fully dependent on the operator's decisions (human-in-the-loop). The manning/crewing levels refer only to the physical presence of humans on board. Although sea drones are generally presumed to be unmanned by definition, the meaning of "manned" craft under the current law is disputed, as will be discussed further below. Conceptually, a sea drone may have no human on board at all (fully unmanned), a limited on-board crew, e.g. to operate weapons (partially manned), or a regular crew on board (fully manned). Consistent with the terminology used in the existing scholarship on "unmanned" crafts, the present analysis focuses on unmanned variants of sea drones.

While this definition focuses on characteristics relevant to a sea drone's legal status rather than its specific operational role, the present analysis centres on those sea drones that are capable of delivering force – i.e., those that are designed or equipped to cause injury, damage or death. The broad scope of the proposed definition is intentional, aiming to encompass a wide range of machine types. This

19 Heather Roff, "Lethal Autonomous Weapons and *Jus ad Bellum* Proportionality", *Case Western Reserve Journal of International Law*, Vol. 47, No. 1, 2015; Dominika Iwan-Sojka, *Responsibility of War Industry for Lethal Autonomous Weapons Systems*, University of Silesia Press, Katowice, 2024.

20 Hitoshi Nasu and David Letts, "The Legal Characterization of Lethal Autonomous Maritime Systems: Warship, Torpedo, or Naval Mine?", *International Law Studies*, Vol. 96, 2020.

21 Matt Bartlett, "Game of Drones: Unmanned Maritime Vehicles and the Law of the Sea", *Auckland University Law Review*, Vol. 24, 2018; David Letts and Raul Pedrozo, "Maritime Drones at War: Legal Issues Affecting Characterization and Use", in N. Klein *et al.* (eds), above note 15; Aurel Dan Maimon, "'Dronization' of the Sea – Ships of the Future", *Annals of "Dunărea de Jos" University of Galati*, Fascicle XI: *Shipbuilding*, Vol. 45, 2022; Bryan Clark, "Sea Drones in the Russia-Ukraine War Inspire New Tactics", *IEEE Spectrum*, 10 July 2024, available at: https://spectrum.ieee.org/sea-drone.

22 In the civil context, the term "maritime autonomous surface ship", developed by the International Maritime Organization's (IMO) Maritime Safety Committee, has entered the legal jargon. Although it is not a legally binding definition, it is widely used in practice. IMO Maritime Safety Commission, *Report of the Maritime Safety Committee on Its One Hundredth Session – Annex 2*, MSC 100/20/Add.1, 12 December 2018, para. 3.

23 Stanislav Hristov Ivanov, "Automated Decision-Making", *Foresight*, Vol. 25, No. 1, 2023, p. 5.

24 Mica R. Endsley and Esin O. Kiris, "The Out-of-the-Loop Performance Problem and Level of Control in Automation", *Human Factors: The Journal of the Human Factors and Ergonomics Society*, Vol. 37, No. 2, 1995, p. 381.

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approach is particularly significant given the heterogeneous and evolving nature of technology, and reflects an intent to avoid excluding any relevant systems whose absence could undermine the legal analysis. The primary objective of this definition is to identify the functional characteristics that matter for legal classification, not to provide a technical taxonomy. Additionally, in the absence of universally accepted definitions, it underscores that the two characteristics discussed above – namely, autonomy and manning – are the sole stable conceptual anchors across all variants.

These considerations are not purely technical or theoretical; they have practical implications for the legal analysis of a sea drone's status. Only a detailed understanding of the analyzed craft can lead to a comprehensive legal classification and the assignment of the corresponding consequences. The following sections provide a detailed analysis of the status of a sea drone under international law.

The sea drone as a warship

Warships represent one of the most enduring categories of seagoing vessels, used throughout the centuries to secure maritime dominance. The contemporary warship definition is codified in UNCLOS, Article 29 of which states that[25]

> [a] "warship" means 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.

The following historical overview explains how this definition emerged and why its elements matter for assessing whether sea drones could fall within this category. Warships, understood broadly as State vessels through the lens of a functional link, were, for the first time, legally distinguished from those operating as "licensed plunderers"[26] – privateers – in the 1856 Paris Declaration Respecting Maritime Law.[27] Building on this fundamental separation, the 1907 Hague Convention (VII) relating to the Conversion of Merchant Ships into War-Ships provided the key requirements for classification as a warship, including that it is under State authority, bears external

25 The 1994 *San Remo Manual on International Law Applicable to Armed Conflicts at Sea* and the 2025 *Newport Manual on the Law of Naval Warfare* employ the warship definition as established by the 1982 UNCLOS. Louise Doswald-Beck (ed.), *San Remo Manual on International Law Applicable to Armed Conflicts at Sea*, Cambridge University Press, Cambridge, 1995 (San Remo Manual), para. 13(g); Wolff Heintschel von Heinegg, James Kraska, David Letts and Raul Pedrozo (eds), *Newport Manual on the Law of Naval Warfare*, 2nd ed., published in *International Law Studies*, Vol. 105, 2025 (Newport Manual), § 3.2.1.

26 Edward Phillips Statham, *Privateers and Privateering*, Cambridge University Press, Cambridge, 2011, p. 3.

27 Wolff Heintschel von Heinegg, "Warships", Press *Max Planck Encyclopedia of Public International Law*, 2023, para. 3; 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", *Melbourne Journal of International Law*, Vol. 21, No. 2, 2020, p. 26.

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identification, follows a command structure and is manned by a disciplined crew.[28] However, it was not until the 1948 Geneva Convention on the High Seas that a single-line warship definition was drafted.[29]

This definition established the basis for the current formulation in UNCLOS Article 29, as presented above. Based on this contemporary definition, a craft must have four basic characteristics to be classified as a warship. First, it must be a ship; second, it must form a part of the State armed forces, bearing marks of its nationality; third, a duly commissioned officer must be in command; and fourth, it must be manned by a disciplined crew. The following sections test sea drone characteristics against those established by UNCLOS Article 29.

State practice and military manuals

An analysis of State practice and military manuals sheds light on how States perceive this emerging category of crafts; nonetheless, evaluating State practice remains challenging due to limited public access to naval registers and the lack of explicit classifications for such crafts. A few available examples demonstrate distinct approaches to the latter issue.[30] The US *Commander's Handbook on the Law of Naval Operations* (US Commander's Handbook), while analyzing the warship status, explicitly states that "[t]here is no requirement [that] the commanding officer or crew be physically on board the warship. Warships may be remotely commanded, crewed, and operated."[31] The 2025 *Newport Manual on the Law of Naval Warfare* (Newport Manual) reaffirms this view by indicating that "[w]arships may … be autonomous or remotely commanded, crewed, and operated by personnel ashore or on board a manned platform".[32]

On the other hand, the *Australian Naval Classification Manual* classifies remote and autonomous systems as "naval vessels"[33] – a broader category than "warship", which indicates that a vessel is a military-operated ship, regardless of whether it is designed for combat. In a similar tone, the US Commander's Handbook explains the "unmanned system status" by stating that

28 Hague Convention (VII) relating to the Conversion of Merchant Ships into War-Ships, 205 CTS 319, 18 October 1907 (entered into force on 26 January 1910).

29 The Geneva Convention on the High Seas, 450 UNTS 11, 29 April 1958 (entered into force 30 September 1962), Article 8(2), states that "the term 'warship' means a ship belonging to the naval forces of a State and bearing the external marks distinguishing warships of its nationality, under the command of an officer duly commissioned by the government and whose name appears in the Navy List, and manned by a crew who are under regular naval discipline".

30 Methodologically, this analysis is selective as access to naval manuals varies significantly across States, and a comprehensive review of all such documents was not feasible within the scope of this research. The examples presented here should therefore be understood as illustrative rather than exhaustive.

31 The previous edition of the US Commander's Handbook (2017) classified such unmanned maritime systems as "sovereign immune craft" (§ 2.3.6); however, this classification has since evolved. US Department of the Navy, *The Commander's Handbook on the Law of Naval Operations*, NWP 1-14M, Navy Warfare Development Command, Norfolk, VA, 2022 (US Commander's Handbook), § 2.2.1.

32 Newport Manual, above note 25, § 3.2.1.

33 Australian Department of Defence, *Australian Naval Classification Manual*, 2023, para. 2.13.

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> [i]n all cases, U.S. Navy [unmanned systems] … [w]hen flagged as a ship … may exercise the navigational rights and freedoms and other internationally lawful uses of the seas related to those freedoms. Unmanned systems may be designated as USS [a Navy ship] if they are under the command of a commissioned officer and manned by a crew under regular armed forces discipline, by remote or other means.[34]

Conversely, Ukraine, when referring to the MAGURA sea drones discussed earlier in this article, typically designates them as "naval drones", "maritime strike drones" or "weapons". There does not seem to be any publicly available evidence indicating that Ukraine has officially classified them as "warships", or that it has even registered them as ships at any point at all.[35]

The Newport Manual expresses an interesting view in this regard:

> Unmanned Maritime Systems (UMS) are prevalent in armed conflict at sea. For example, since the escalation of the Russia-Ukraine War in 2022, both States have employed remotely controlled, explosive-laden, expendable UMS to conduct attacks. These UMSs have been used successfully to conduct attacks on enemy ships at sea and in port, as well as on lines of communication (e.g., bridges). Neither side has indicated whether they have designated their UMSs as vessels or consider them to be a weapon system or vessel or both. According to the present Manual, such systems qualify as weapons rather than as UMS that could be classified as warships.[36]

This approach appears to introduce operational characteristics such as the "remotely controlled, explosive-laden, expendable" nature of certain systems as determinative factors in their legal classification. Yet these considerations do not stem from UNCLOS Article 29, or from established doctrine on warship status, and the Newport Manual does not clarify whether such operational features form the basis of its own classification.

This demonstrates a broader lack of coherence in current State and doctrinal approaches to unmanned maritime systems. Thus, while US practice suggests that unmanned systems may qualify as warships, the other provided examples – such as those of Australia and Ukraine – do not yet allow conclusions about broader State practice, necessitating a doctrinal analysis of UNCLOS Article 29.

34 US Commander's Handbook, above note 31, § 2.3.5.

35 Charles M. Layne, "Ukraine Symposium – Ukraine's 'Suicide Drone Boats' and International Law", *Articles of War*, 25 January 2023, available at: https://lieber.westpoint.edu/ukraines-suicide-drone-boats-international-law/; Defence Intelligence of Ukraine, "Magura V5 – A Weapon that Guarantees Ukraine's Maritime Law", 28 December 2024, available at: https://gur.gov.ua/en/content/magura-v5-zbroia-iaka-harantuie-morske-pravo-ukrainy; Defence Intelligence of Ukraine, "The Era of Magura: Defence Intelligence of Ukraine Unveils Revolutionary Naval Drones Capable of Destroying Enemy Ships and Aircraft", 15 May 2025, available at: https://gur.gov.ua/en/content/era-maury-komanda-hur-vpershe-prezentuvala-novitni-morski-drony-zdatni-nyshchyty-vorozhi-korabli-ta-litaky.

36 Newport Manual, above note 25, § 6.7.

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Ship requirement

Public international law does not offer a legal definition of a "vessel". Terms such as "vessel", "ship" or "boat" are also often used interchangeably to describe the same concept. Linguistically, a vessel is defined as "a ship or large boat", while a ship is "a large boat used for traveling long distances over the sea".[37] A boat, on the other hand, is simply "a vehicle of any size used for traveling on water".[38] Furthermore, the law of the sea and international maritime law conventions define these terms differently.[39] However, none of these definitions refer to the operational mode – i.e., who is responsible for the decision-making process – or require human presence on board to classify a craft as a vessel. The scholarship also generally agrees that autonomy and manning levels do not affect the ship's classification.[40] For these reasons, a sea drone, independently of the human-in/-on/-off-the-loop configuration, and with or without human presence on board, can be classified as a vessel: it is a waterborne craft designed for navigation and operation at sea, and thus, it complies with the first UNCLOS Article 29 warship requirement. Limited available State practice also supports this interpretation, as several States classify unmanned surface craft as vessels for regulatory purposes.[41]

External marks and attribution requirements

The integration of sea drones into States' armed forces is becoming more common. Examples from States such as Ukraine, Iran, the United States, the United Kingdom and China demonstrate that maritime unmanned and autonomous systems are now a part of not only navies but also broader military forces.[42] Thus, a sea drone may

37 "Vessel", *Britannica Dictionary*, available at: www.britannica.com/dictionary/vessel; "Ship", *Britannica Dictionary*, available at: www.britannica.com/dictionary/ship.

38 "Boat", *Britannica Dictionary*, available at: www.britannica.com/dictionary/boat.

39 Sabrina Hasan, "Analysing the Definition of 'Ship' to Facilitate Marine Autonomous Surface Ships as Ship[s] under the Law of the Sea", *Australian Journal of Maritime and Ocean Affairs*, Vol. 15, No. 3, 2023, pp. 268–269.

40 For authors supporting this view, see S. McKenzie, above note 27, pp. 1–2; J. Kraska, above note 16, p. 53; B. Stępień, above note 12, pp. 3–4. For alternative voices, see Michael N. Schmitt and David S. Goddard, "International Law and the Military Use of Unmanned Maritime Systems", *International Review of the Red Cross*, Vol. 98, No. 902, 2016, p. 576.

41 For example, the United Kingdom treats unmanned crafts as vessels. The Australian Maritime Safety Authority likewise notes that unmanned surface vessels are subject to "the same regulatory framework as other vessels, including for survey standards and crewing requirements. This is because the definitions of 'vessel' in the Navigation Act 2012 and the Marine Safety (Domestic Commercial Vessel) National Law Act 2012 are very broad." Canada has incorporated the IMO terminology of "maritime autonomous surface ships" into its domestic legislation, explicitly referring to them as ships. New Zealand similarly treats such craft as "vessels" and permits their registration. Finally, the IMO classifies them as "maritime autonomous surface ships" within its regulatory framework. UK Maritime and Coastguard Agency, *The Workboat Code*, Southampton, 2025, p. 27; UK Department for Transport, *Maritime 2025: Navigating the Future*, London, 2019, p. 90; Government of Canada, "Marine Safety and Security Management System: Tier I – Policy – Oversight of Small Maritime Autonomous Surface Ships (MASS)", 2022, p. 2; IMO Maritime Safety Committee, above note 22, para. 3.

42 Raul Pedrozo, "Unmanned and Autonomous Warships and Military Aircraft", in James Kraska and Young-Kil Park (eds), *Emerging Technology and the Law of the Sea*, Cambridge University Press,

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belong to the State's armed forces in the understanding of UNCLOS Article 29, even though it is not exactly clear whether, for example, the State's ownership, control or responsibility is required by this provision.[43] Furthermore, if a State considers its sea drone to be a vessel, it should flag the drone under UNCLOS Article 91.[44] Thus, there are no technical or legal obstacles preventing sea drones from bearing the external marks distinguishing them by their nationality; they may, similar to conventional warships, carry a visible naval ensign.[45]

Command and official listing requirements

As stated by UNCLOS Article 29, a warship must be "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". Two important questions emerge in this context regarding sea drone compliance. One difficulty lies in the fact that neither UNCLOS nor any other international regulation explains what the term "under the command" encompasses; another concern relates to whether AI could qualify as a commanding officer, in the case of sea drones with human-off-the-loop.

To begin with, as noted above, international law does not define the term "under the command" – or even the term "command". There are also various definitions of this concept present in the military scholarship.[46] The most basic one describes command as "act[ing] on a will",[47] while others add that such a will must

Cambridge, 2022, pp. 273–282; George Allison, "Royal Navy Seeks Industry Input to Integrate Drones to Fleet", *UK Defence Journal*, 11 March 2025, available at: https://ukdefencejournal.org.uk/royal-navy-seeks-industry-input-to-integrate-drones-to-fleet/; Ruth Arteaga, "China Strengthens Its Naval Fleet with the Type 076 Shandong, the Giant Drone Carrier", *Inspenet*, 26 January 2025, available at: https://inspenet.com/en/noticias/china-strengthens-its-naval-fleet-with-the-type-076-shandong-the-giant-drone-carrier/; Agencies and TOI Staff, "Iran's First Drone Carrier Joins Revolutionary Guards Fleet", *Times of Israel*, 19 January 2026, available at: www.timesofisrael.com/irans-first-drone-carrier-joins-revolutionary-guards-fleet/.

43 For example, the 2025 Newport Manual suggests that a warship is "under the direct authority, immediate control, and responsibility of the flag State". Newport Manual, above note 25, § 3.2.1.

44 UNCLOS Article 94(4)(b)–(c) regulates the flag State's duties concerning the safe manning of ships. Schmitt and Goddard argue that the references to master, officers and crew in this provision may be read as supporting the view that manning is a necessary condition for the legal classification of a craft as a vessel. In the author's view, however, this does not amount to a definitional requirement for vessel status; Article 94(4)(b)–(c) sets out operational obligations for flag States rather than criteria for determining what constitutes a vessel. M, N. Schmitt and D, S. Goddard, above note 40, p. 576.

45 In modern times, vessels are assigned a unique identifier known as a Maritime Mobile Service Identity (MMSI) number. Given that the MMSI number encodes the flag State information, it might be considered a digital flagging of a vessel; however, it is not yet a legally recognized substitute for a physical flagging, but is rather considered an additional source of information on the vessel's flag. International Telecommunication Union, "Assignment and Use of Identities in the Maritime Mobile Service", Recommendation ITU-R M.585-8, October 2019, Annex I.

46 Rain Liivoja, Eve Massingham and Simon McKenzie, "The Legal Requirement for Command and the Future of Autonomous Military Platforms", *International Law Studies*, Vol. 99, 2022, p. 649.

47 Emmanuel Levinas, "Freedom and Command", in Emmanuel Levinas, *Collected Philosophical Papers*, Phaenomenologica Series, Vol. 100, Martinus Nijhoff, Dordrecht, 1987, p. 15.

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be necessary to "accomplish the mission".[48] On the other hand, an ordinary meaning of the term "command" encompasses ordering someone in a "forceful" and "official way" to undertake conduct.[49] None of the provided definitions invoke the necessity of the shared *situs* – i.e., that a person issuing the command needs to be physically located in the same place as the subject of the command. In light of the foregoing, an unmanned sea drone with human-in and -on-the-loop can be "under the command" of a remote operator in accordance with the analyzed provision.

The second question of whether AI can be regarded as an officer duly commissioned by the State presents a particularly challenging issue. Providing an answer to this question remains especially important within the context of fully autonomous and unmanned sea drones (operating with human-off-the-loop). Although such a scenario is currently unlikely, given that publicly known technological development primarily emphasizes fully unmanned systems with varying levels of operational autonomy but with human-in or on-the-loop, it cannot be excluded that classified programmes may follow different trajectories. Hence, the potential future significance of this question remains noteworthy. In such a case, an AI would need to be granted a formal military State commission, registered in the official records, to be regarded as an officer. Yet, this would not be possible without the AI achieving a human-like status first (i.e., personhood[50]), given that – as of now – only persons can be members of the armed forces. Thus, since a philosophical discussion on the nature of robots and AI exceeds the scope of this article, it must be concluded that a fully autonomous sea drone with human-off-the-loop cannot, at this point of unresolved scholarly debate on AI personhood,[51] comply with the mentioned requisites derived from UNCLOS Article 29 on the notion of command.

Manning and discipline requirements

The last requirement – being manned by a crew under regular armed forces discipline – is the most challenging part of the warship test under UNCLOS Article 29. It requires addressing two questions: whether a sea drone can be "remotely manned"[52] and therefore classified as a warship, and the scope of the term "crew under regular armed forces discipline".

48 Ross Pigeau and Carol McCann, "Re-Conceptualizing Command and Control", *Canadian Military Journal*, Vol. 3, No. 2, 2002, p. 56.

49 "Command", *Britannica Dictionary*, available at: www.britannica.com/dictionary/command.

50 Virginia Dignum, "Ethics in Artificial Intelligence: Introduction to the Special Issue", *Ethics and Information Technology*, Vol. 20, No. 1, 2018.

51 Arghya Sen, "Artificial Intelligence and Autonomous Systems: A Legal Perspective on Granting Personhood and Implications of Such a Decision", *DME Journal of Law*, Vol. 4, No. 1, 2023.

52 While Pedrozo supports the view that "remote manning" is a possible solution, Veal, Tsimplis and Serdy consider it to be too permissive. R. Pedrozo, above note 42, p. 292; Robert Veal, Michael Tsimplis and Andrew Serdy, "The Legal Status and Operation of Unmanned Maritime Vehicles", *Ocean Development and International Law*, Vol. 50, No. 1, 2019, p. 31.

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Firstly, it is worth noting that manning is one of the key factors that enable a vessel to achieve warship status. In other words, while the craft's status as a vessel is not affected by the presence or absence of a crew on board, UNCLOS Article 29 explicitly requires the physical presence of a crew to categorize a vessel as a warship. The construction of this provision is rooted in the prohibition of privateering, mentioned previously, and the need to distinguish State vessels from those operated by private individuals during naval hostilities.[53] It derives from the presupposition that a warship is "an expression of the sovereignty of the State whose flag it flies".[54] Consequently, a warship enjoys certain rights and obligations, absent in the context of non-State vessels,[55] which are further discussed in the next section.

The "regular armed forces discipline" requirement is a concern similar to the case of the commanding officer, whose name should appear on the appropriate service list or its equivalent, as addressed above. For the same reasons, persons involved in a sea drone's operations, to be considered crew members under UNCLOS Article 29, must be members of the flag State's armed forces. The engagement of only private contractors or civilians in the operation of sea drones, without any disciplined crew, does not comply with the established provisions. The presence of a disciplined crew on board presumes service within a clear hierarchical order and chain of command.

Consequently, under the current regulations, the physical presence of crew on board is a decisive factor distinguishing a warship from a civilian vessel or undefined floating craft.[56] Thus, fully unmanned sea drones, even with a certain level of remote human involvement at the operational level (e.g., with a shore-based human-in and -on-the-loop remote operator), cannot comply with the requirements of UNCLOS Article 29 on manning.[57]

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53 S. McKenzie, above note 27, p. 26.

54 International Tribunal for the Law of the Sea, *The "ARA Libertad" Case (Argentina v. Ghana)*, Provisional Measures, 2012, para. 94.

55 Warships belong to a wider category of State vessels operated by the government for non-commercial purposes. Gil Carlos Rodríguez Iglesias, "State Ships", *Max Planck Encyclopedia of Public International Law*, 2023, para. 1.

56 An interesting comparative example comes from air warfare. The definition of a military aircraft does not universally require a craft to meet the manning requirement to be classified as such. Unlike the treaty-based definition of a warship under UNCLOS Article 29, there is no universally accepted definition of a military aircraft that stipulates a minimum crew as a necessary requirement for its classification. While some legal instruments assume that military aircraft should be manned (e.g., San Remo Manual, above note 25, para. 13(j)), others allow unmanned aerial vehicles to be classified as military aircraft (e.g., Harvard Manual, below, p. 10). Some authors argue that a stricter definition of warships may stem from the extensive rights and immunities they enjoy, as discussed further in this article. Harvard Program on Humanitarian Policy and Conflict Research, *HPCR Manual on International Law Applicable to Air and Missile Warfare*, Cambridge University Press, Cambridge, 2013 (Harvard Manual), p. 10; San Remo Manual, above note 25, para. 13(j); Mateusz Piątkowski, "The Markings of Military Aircraft under the Law of Aerial Warfare", *Military Law and the Law of War Review*, Vol. 58, No. 1, 2020, p. 70.

57 The question of a warship's manning has been addressed in the scholarship in the context of the legal status of warship wrecks (i.e., whether a sunken warship still preserves its warship status and enjoys related privileges such as sovereign immunity). For example, Jennings and Watts have presented a view that "warships are state organs only so long as they are manned and under the command of a responsible officer, and further, so long as they are in the service of a state". Even though this argument was raised in a context of sunken warships, it supports the present author's view on manning as a *condicio sine qua non* for the warship classification. Robert Jennings and Arthur Watts, "Miscellaneous Agencies", in Robert Jennings

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To summarize, fully unmanned sea drones (which are the focus of the present analysis), independent from human involvement at the operational level, fail to pass the UNCLOS Article 29 warship test. Even if they fulfil certain criteria, such as being flagged vessels, and some interpretative flexibility allows for accommodating a shore-based remote operator as the commanding officer, the manning requirement is not met. For these reasons, an alternative classification of sea drones is necessary and can be found within the international humanitarian law regulatory framework. The following section analyzes this alternative.

If not a warship, then what? Sea drones as weapons

As established above, manning by a crew under regular armed forces discipline is what could make a sea drone a warship. In the absence of manning, sea drones capable of projecting force are closer in nature to means of (naval) warfare,[58] which are understood as weapons and weapons systems deployed during an armed conflict.[59] Military doctrine and scholarship consider means of warfare in a broad sense as devices, substances, systems, munitions and other types of equipment designed to cause injury or damage to an opposing force during an armed conflict.[60] Naval mines, torpedoes, missiles and other projectiles are the most common types of naval means of warfare.[61]

This article argues that certain sea drones share certain functional and operational characteristics with naval means of warfare, especially naval mines, as explained further in this section. A brief comparison with torpedoes is also presented; however, since the legal distinction between torpedoes and mines is rather blurry,[62] this comparison provides limited analytical input. Sea drones are not, however, comparable to missiles and other projectiles, given that the latter are single-use munitions designed to be launched and to travel on a fixed trajectory toward a target,[63] which is not the case with sea drones. Sea drones also intersect

and Arthur Watts (eds), *Oppenheim's International Law*, Vol. 1, Oxford University Press, New York, 2008, para. 560.

58 The classification of sea drones as a means of warfare also intersects with methods of warfare, i.e., the manner in which the weapons are deployed. As this article focuses on their legal status rather than their operational use, the discussion is limited to their characterization as means of warfare.

59 William H. Boothby, *Weapons and the Law of Armed Conflict*, Oxford University Press, Oxford, 2009, pp. 4–5.

60 *Ibid.*, p. 4; Yves Sandoz, Christophe Swinarski and Bruno Zimmermann (eds), *Commentary on the Additional Protocols*, International Committee of the Red Cross, Geneva, 1987, para. 1402.

61 San Remo Manual, above note 25, paras 78–80.

62 Originally, the notion of "torpedo" encompassed a similar type of device as a "mine" today. A distinction between these two devices, present in Hague Convention VIII, derived from the fact that torpedoes have to be designed to self-neutralize after they have missed their targets. Newport Manual, above note 25, § 6.6.

63 Bruno Demeyere, "Missile Warfare", *Max Planck Encyclopedia of Public International Law*, 2023, paras 9–12.

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conceptually with the broader notion of autonomous weapons systems, a topic that is increasingly discussed in scholarship. However, as the scope of this section is limited to naval means of warfare, a broader debate on autonomous weapons systems is left for future work.[64]

The features of naval mines, as presented below, correspond to the emerging category of sea drones, whose operational profile closely aligns with many functions traditionally associated with naval mines. Multiple scenarios might be developed to demonstrate the operational similarities between the two. For example, an armed and unmanned sea drone may be left to drift with water currents, triggering attack or detonation based on the impulses received from its in-built sensors; sea drones may also remain free-floating in an uncontrolled manner as post-hostilities threats, similar to naval mines.

On the other hand, the functional characteristics of sea drones, such as mobility, speed, strike capacity and precision, support the analogy with torpedoes, which are self-propelled underwater munitions with an explosive warhead designed to target other vessels.

Therefore, this section establishes an analogy between sea drones and these two types of naval means of warfare (i.e., naval mines and torpedoes), considering that naval mines and torpedoes serve as the most relevant historical and legal precedents for maritime autonomous and unmanned systems, despite not having identical characteristics with sea drones.[65] Accordingly, the international framework applicable to naval mines and torpedoes is analyzed below to reach pertinent conclusions.

A wide range of naval mines exists in the current stage of technological development, from traditional contact mines to smart and missile-age mines. Modern smart mines, such as the Turkish Malaman, are reported to be able to identify targets, categorize them, and trigger detonation at the strategically optimal moment.[66] All of this is possible, as reported, due to the complex algorithms that these mines are programmed with, which allow them to analyze data in real time and make autonomous decisions.[67] Remote operators may activate and deactivate them from a distance, and they are also equipped with a self-neutralization mechanism. From a functional standpoint, naval mines are unmanned devices deployed in an aquatic environment. Their tasks are to deter, damage or destroy other vessels, and

64 Nevertheless, a reader interested in this topic may consult P. Asaro, above note 18; J. G. Foy, above note 18; D. N. Hammond, above note 18; Jared M. Cochrane, "Conducting Article 36 Legal Reviews for Lethal Autonomous Weapons", *Journal of Science Policy and Governance*, Vol. 16, No. 1, 2020; H. Roff, above note 19; D. Iwan-Sojka, above note 19; M. Marcinko, above note 18.

65 For a detailed analysis of the role of analogies in IHL, see Pauline Lesaffre, "Analogies in the Historical Development of IHL (1864–2001)", *International Review of the Red Cross*, Vol. 107, No. 930, 2025.

66 "DSA 2024: Türkiye Presents Malaman Smart Naval Mine", Army Recognition Group, 7 May 2024, available at: www.armyrecognition.com/news/navy-news/2024/dsa-2024-tuerkiye-presents-malaman-smart-naval-mine.

67 Defence Agenda, "Completion of All Tests for MALAMAN Smart Naval Mine", *Defence Agenda*, 2 August 2025, available at: https://defenceagenda.com/malaman-smart-naval-mine/.

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they can also establish zones of denial or exclusion at sea (e.g., naval blockades[68]). Sea drones may be deployed for similar purposes.

To date, however, there is no legal definition of naval mines or torpedoes at the international level,[69] and the sole international convention addressing mine and torpedo warfare – the 1907 Hague Convention (VIII) relative to the Laying of Automatic Submarine Contact Mines (Hague Convention VIII)[70] – does not provide any definition for them.[71] Adopted in the aftermath of the Russo-Japanese War of 1904–05,[72] Hague Convention VIII aimed to diminish the negative impact of war while enhancing the safety and security of navigation despite it.[73] It provides a catalogue of restrictions and prohibitions for automatic contact mines (those that explode upon contact with a vessel), the primary type of mines at the time of its adoption. Firstly, Hague Convention VIII prohibits laying unanchored, free-floating contact mines, unless their construction allows them to become harmless within a maximum of one hour after losing control over them.[74] Secondly, it bans the usage of anchored automatic contact mines which do not become harmless immediately after breaking loose from their tethering.[75] Regarding torpedoes, Hague Convention VIII mentions them only once, stating that they must become harmless after missing their target.[76] Finally, it obligates Neutral Powers, belligerent States and Contracting Parties to provide navigational safety through various means to the fullest extent possible in the zones where mines are laid.[77]

Over the years, Hague Convention VIII has diminished in legal significance, mainly due to technological developments and the deployment of modern types of naval mines. Nevertheless, the core principles it created have become customary international law,[78] providing guiding principles for the review of naval mines.[79]

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68 A reader interested in the topic of naval blockades may consult Barbara Stępień, "The Maritime Siege – Characteristics, Objectives and Consequences of a Naval Blockade during Armed Conflicts at Sea", *Międzynarodowe Prawo Humanitarne*, Vol. 6, 2015.

69 Wolff Heintschel Von Heinegg, "The International Law of Mine Warfare at Sea", in Yoram Dinstein and Fania Domb (eds), *The Progression of International Law*, Brill, Leiden, 2011, p. 379.

70 Hague Convention (VIII) relative to the Laying of Automatic Submarine Contact Mines, 205 CTS 331, 18 October 1907 (entered into force 26 January 1910) (Hague Convention VIII).

71 The commentary to the San Remo Manual provides an informal description of a naval mine, denoting it as "an explosive device laid in the water, on the sea-bed or in the subsoil thereof, with the intention of damaging or sinking ships or of deterring ships from entering an area". San Remo Manual, above note 25, p. 169.

72 H. Nasu and D. Letts, above note 20, pp. 80–81.

73 Hague Convention VIII underlines these aims in its preamble, stating that "it is nevertheless desirable to restrict and regulate their employment in order to mitigate the severity of war and to ensure, as far as possible, to peaceful navigation the security to which it is entitled, despite the existence of war". Hague Convention VIII, above note 70, Preamble.

74 *Ibid.*, Art.1(1).

75 *Ibid.*, Art. 1(2).

76 *Ibid.*, Art. 1(3).

77 *Ibid.*, Arts 3–7.

78 W. Heintschel Von Heinegg, above note 69, p. 378; David Letts, "Beyond Hague VIII: Other Legal Limits on Naval Mine Warfare", *International Law Studies*, Vol. 90, 2014, p. 474.

79 The naval mines regulatory framework includes a package of customary and treaty regulations deriving from – besides Hague Convention VIII – the 1982 UNCLOS, the 1954 Hague Cultural Property

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The analogy between sea drones and naval mines/torpedoes bears concrete regulatory lessons for the former.[80] In broad terms, sea drones considered as a new means of warfare would fall within the scope of AP I Article 36 on weapons review obligations, requiring States to assess their compliance with international law prior to deployment. Also, belligerent States should, as a matter of *lege ferenda*, ensure navigational safety,[81] mainly of civilian and neutral vessels, in sea drones' operational regions.

This latter task can be accomplished to varying degrees depending on the sea drone's configuration. In the case of fully unmanned sea drones with human-in-the-loop, a remote operator should be able to steer the drone away from neutral and civilian vessels, diminishing the risk of indiscriminate attacks. In a scenario involving a sea drone with human-on-the-loop, the danger that a sea drone will drift into neutral waters or engage with neutral or civilian vessels is greater due to possible delays in the remote operator's intervention. Finally, fully autonomous sea drones, which operate with human-off-the-loop, may cause the most severe difficulties and risks. The absence of real-time human oversight and the unpredictability of AI-operated sea drones (e.g., the black box problem[82]) may result in violations of both treaty and customary principles governing naval warfare (e.g., indiscriminate attacks, lack of precaution, or attacks violating the principle of proportionality, to name just a few[83]).

Also, similar to naval mines, as a matter of *lege ferenda*, fully unmanned sea drones should self-neutralize within one hour after the remote operator loses control (human-in-the-loop) or oversight (human-on-the-loop) over them. In the case of fully autonomous and unmanned sea drones, a similar requirement should be enforced after they lose contact with their operational headquarters. In the event that sea drones are deployed for one-way attacks[84] (i.e., missions in which they are intended to be expended upon impact, similar to torpedoes), they should self-neutralize after missing their target.

Convention (and its 1954 and 1999 Protocols) and the 1980 Convention on Certain Conventional Weapons and its Protocols. D. Letts, above note 78, pp. 462–470.

80 AP I, Art. 36.

81 A similar concern for navigational safety is addressed in the rules governing the laying of automatic contact mines. See Hague Convention VIII, above note 74, Arts 3–5.

82 The black box problem denotes opacity in decision-making processes conducted by AI; in other words, it refers to a situation where humans are unable to determine why or how the algorithms arrived at the final result. Bartosz Brożek, Michał Furman, Marek Jakubiec and Bartłomiej Kucharzyk, "The Black Box Problem Revisited: Real and Imaginary Challenges for Automated Legal Decision Making", *Artificial Intelligence and Law*, Vol. 32, No. 2, 2024, p. 427.

83 Judith Gardam, *Necessity, Proportionality and the Use of Force by States*, Cambridge Studies in International and Comparative Law, Vol. 35, Cambridge University Press, New York, 2006; Michael N. Schmitt, "Military Necessity and Humanity in International Humanitarian Law: Preserving the Delicate Balance", in Michael N. Schmitt, *Essays on Law and War at the Fault Lines*, T. M. C. Asser Press, The Hague, 2011; H. Roff, above note 19; Jens David Ohlin and Larry May, *Necessity in International Law*, Oxford University Press, New York, 2016; Amichai Cohen and David Zlotogorski, *Proportionality in International Humanitarian Law: Consequences, Precautions, and Procedures*, Oxford University Press, New York, 2021.

84 C. M. Layne, above note 35.

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To summarize, a complex characteristic of sea drones, namely the combination of being unmanned and having varying degrees of human involvement at the operational level, challenges the existing legal framework on means of naval warfare. Nevertheless, as demonstrated in this section, multiple functional similarities with their more traditional counterparts, such as naval mines and torpedoes, enable us to shed some light on the possible legal requirements for sea drones. To date, no military manual has addressed these issues explicitly. Given the functional parallels with naval mines and torpedoes, States should be encouraged to reflect these analogies in future doctrinal guidance, thereby contributing to a clearer and more coherent legal framework for sea drones.

Legal relevance of sea drone status

As explained in the previous sections, sea drones could potentially be accommodated within the existing regulatory framework under one of two mutually exclusive categories: warships, as defined in UNCLOS Article 29, or means of warfare, as articulated in AP I Article 35.

The classification of sea drones extends beyond a purely theoretical exercise and has practical implications for their rights and obligations during both peace and wartime – in other words, under the law of the sea and the law of armed conflict. The following sections examine the key legal implications of each classification.

Sea drones in times of peace

States may use sea drones, similar to warships and other State vessels, for various purposes, including peacetime operations (e.g., border control, protecting communication lines, and anti-piracy patrols[85]). Thus, the status of sea drones as either warships or naval weapons generates concrete consequences during their operation, not only in war but also in peacetime.[86] There are three primary issues associated with sea drones' status: firstly, their sovereign immunity; secondly, their navigational entitlements; and thirdly, the consequences of the use of force against them, under Article 51 of the Charter of the United Nations (UN Charter).

Assuming that a sea drone could be classified as a warship (setting aside, for the moment, its non-compliance with the requirements of UNCLOS Article 29), it

85 Operation Atalanta, conducted by the European Union since 2008, is an example of peacetime anti-piracy efforts aimed at improving maritime security in the Western Indian Ocean and Red Sea. European Union, "European Union Naval Force Operation ATALANTA – EUNAVFOR ATALANTA", available at: https://eunavfor.eu/.

86 Schmitt and Goddard have argued that in peacetime, many rights associated with warship status may also be exercised by other vessels that are clearly marked and identifiable as being on government service and duly authorized to that effect. Even in such a case, however, sea drones would need to be classified as government ships operated for non-commercial purposes, rather than, for example, as a means of warfare. This view suggests that a warship's status is less significant in peacetime than in wartime, as also further demonstrated in the present article. M. N. Schmitt and D. S. Goddard, above note 40, p. 579.

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would enjoy sovereign immunity, a status granted to vessels operated by the government for non-commercial purposes.[87] UNCLOS Article 32, included in the part of the Convention on territorial seas, states that "nothing in this Convention affects the immunities of warships and other government ships operated for non-commercial purposes [except the provisions included in subsection A and in Articles 30 and 31]".[88] Then, UNCLOS Articles 95–96 underline that the sovereign immunity of warships also applies on the high seas and in exclusive economic zones (EEZs). Conversely, if a sea drone is considered a means of naval warfare, it would not ordinarily enjoy sovereign immunity privilege based exclusively on its classification. This is because its unmanned nature brings into question its legal status as an "extension of the State's sovereignty", without which a sea drone may be viewed as just an armed hull, as argued in the section above. On the other hand, if a sea drone operates as part of the State's armed forces or is considered a government vessel used for non-commercial purposes, it might benefit from sovereign immunity due to its functional link, rather than its classification.[89]

Regarding the navigational entitlements resulting from a sea drone's possible status as a warship, the right of innocent passage requires analysis. The long-standing innocent passage right through a coastal State's territorial sea, codified in UNCLOS Article 17, is granted to "ships of all States, whether coastal or land-locked". It encompasses two scenarios: (a) traversing the territorial sea of a coastal State without entering its internal waters, or calling at a roadstead or port facilities located outside them; and (b) travelling to or from such waters or facilities.[90] Even though the warship's right of innocent passage is not uniformly interpreted either in the scholarship or in State practice,[91] UNCLOS does not exclude the application of this provision to warships.

Thus, as a general rule, a sea drone enjoying warship status could exercise its right of innocent passage through a coastal State's territorial seas as long as the coastal State does not consider such a passage as prejudicial to peace, good order or its security.[92] Also, UNCLOS Article 20 requires "submarines and other underwater vehicles … to navigate on the surface and to show their flag" during their transit via the territorial sea of a coastal State. Given that certain sea drones may operate underwater, this provision imposes additional peacetime constraints on their deployment.

In contrast, if classified as a weapon, a sea drone would lack any navigational rights, including the right to innocent passage.[93] This classification would

87 Jason R. Harris, "Protecting Sunken Warships as Objects Entitled to Sovereign Immunity", *University of Miami Inter-American Law Review*, Vol. 33, No. 1, 2002; Naomi Catherine and Imam Mulyana, "The Implementation of Sovereign Immunity of Warships to Unmanned Underwater Vehicles (UUV) under [the] Law of the Sea", *Padjadjaran Journal of International Law*, Vol. 6, No. 1, 2022; J. Kraska, above note 15.

88 UNCLOS, above note 9, Art. 32.

89 J. Kraska, above note 15.

90 UNCLOS, above note 9, Art. 18(1)(a)–(b).

91 W. Heintschel von Heinegg, above note 27, para. 35.

92 UNCLOS, above note 9, Art. 19(1).

93 H. Nasu and D. Letts, above note 21, p. 95.

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also strengthen a coastal State's ability to invoke the prejudicial nature of the sea drone's presence within its territorial seas.[94] Moreover, such a situation – a sea drone's presence within another State's territorial sea – could be considered a violation of the coastal State's sovereignty, or in certain cases, even an unlawful use of force.[95] Consequently, the lack of navigational rights and the other above-mentioned problems would significantly limit a sea drone's operational area.

In the case of use of force against a sea drone, it is noteworthy that warships are considered "a political and military instrumentality of the State".[96] This means that an act of violence against a sea drone that is classified as a warship could, depending on the circumstances, amount to an armed attack in the sense of the of UN Charter Article 51, and not merely an unlawful use of force.[97] Consequently, the flag State could respond within its right to self-defence.[98] On the other hand, if a sea drone is considered within the framework of means of warfare, a use of force against it would not, in itself, amount to an armed attack as discussed above, although it may still constitute an unlawful use of force under UN Charter Article 2(4).[99]

Sea drones in times of war

Warships are the only types of vessels that enjoy belligerent rights under the law of armed conflict;[100] thus, the sea drone's classification as such would allow it to engage in belligerent acts during an international armed conflict and to employ the means and methods of naval warfare[101] (e.g., enforcing a naval blockade or exclusion zone[102]). If they could be considered as warships, sea drones would also have the right not only to attack military objectives but also to visit, search, divert and capture enemy and neutral merchant vessels as per the rules on these topics contained in the law of naval warfare.[103] Moreover, as a matter of legal entitlements, they could

94 A coastal State could argue, *inter alia*, that a sea drone's presence within its territorial sea falls under the concept of non-innocent behaviour set forth in UNCLOS Article 19(2), such as an exercise or practice with weapons, an attempt to collect information or to interfere with any of the coastal State's communication systems or other facilities or installations, or engaging in any other activities not having a direct relation to the passage. UNCLOS, above note 9, Art. 19(2)(b), (c), (k), (l).

95 The International Court of Justice (ICJ) addressed a similar problem in the *Nicaragua* case, expressing the view that "the [US] mining operations in the Nicaraguan ports not only constitute breaches of the principle of the non-use of force, but also affect Nicaragua's sovereignty over certain maritime expanses". ICJ, *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States)*, Judgment, 27 June 1986, para. 251.

96 Bernard H. Oxman, "The Regime of Warships under the United Nations Convention on the Law of the Sea", *Virginia Journal of International Law*, Vol. 24, 1984, pp. 813–814.

97 Charter of the United Nations, 1 UNTS XVI, 26 June 1945 (entered into force 24 October 1945), Art. 2(4).

98 *Ibid.*, Art. 51.

99 A similar distinction between an unlawful use of force and an "armed attack" was drawn by the ICJ in the *Nicaragua* case, particularly in its discussion of the gravity threshold. ICJ, *Nicaragua*, above note 95, para. 195.

100 H. Nasu and D. Letts, above note 20, p. 86.

101 W. Heintschel von Heinegg, above note 27, para. 51.

102 San Remo Manual, above note 25, paras 93–108.

103 W. Heintschel von Heinegg, above note 27, para. 51.

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undertake inspection of specially protected enemy vessels (e.g., hospital ships), as well as control neutral vessels and aircraft within operational zones. However, the practical exercise of certain rights, such as visit, search and inspection, presupposes human presence and judgement;[104] therefore, fully unmanned sea drones are likely unable to perform these functions in practice, even if they are classified as warships. Sea drones enjoying warship status would be entitled to demand that enemy personnel surrender and to undertake convoy operations,[105] and at the same time would be lawful military objectives by nature. For the reasons explained above, some States find it strategically advantageous to follow this classification.[106]

Conversely, a sea drone considered as a naval means of warfare would lack its own belligerent rights. The State would enjoy belligerent rights, allowing it to deploy a sea drone just as with any other type of weapon such as a naval mine or torpedo,[107] the use of which would remain subject to the general restrictions on means and methods of warfare under IHL.[108] A sea drone would be simply a material asset of a State, rather than an entity capable of possessing its own rights or privileges.

Conclusion

Drones have been revolutionizing the commercial and military industries for a number of years, and now, sea drones are also transforming naval warfare. However, even though sea drones appear to be a highly innovative product of the twenty-first century, they share multiple legal characteristics with conventional military platforms and means of naval warfare, as demonstrated above. If manned, even if only with the crew operating the guns, they can be classified as warships under UNCLOS Article 29. On the other hand, a sea drone, while operating in an unmanned capacity independent from human involvement in its operation (human-in, -on or -off-the-loop), may constitute a means of warfare under IHL. The physical presence of the onboard crew constitutes a decisive factor in the mentioned classifications, resulting in various legal consequences, as explained in this paper.

It is likely that maritime powers, following the US example, will support a broader and more comprehensive warship status for sea drones,[109] granting them a full package of rights and privileges, as presented above. However, it is doubtful whether such a legal classification, based on a policy decision rather than on the strict application of the law, is desirable in light of the multiple legal and ethical questions related to the nature of autonomous and unmanned systems. As the discussion on

104 Geneva Convention (II) for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea of 12 August 1949, 75 UNTS 85 (entered into force 21 October 1950), Art. 31.

105 Newport Manual, above note 25, § 6.6.

106 US Commander's Handbook, above note 31, §§ 2.2.1, 2.3.5.

107 H. Nasu and D. Letts, above note 20, p. 95.

108 AP I, Art. 35(1).

109 US Commander's Handbook, above note 31, § 2.2.1.

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the Newport Manual demonstrates, operational realities may inform classification debates, but elevating them above treaty-based criteria risks creating inconsistency and enabling States to classify unmanned systems at will.[110] In turn, it will likely undermine legal certainty and blur the distinction between vessels and weapons.

This dynamic underscores the need for the international community to engage more deliberately in shaping the legal framework, rather than leaving its evolution solely to the major naval powers whose practice has historically carried disproportionate weight. Accordingly, it would be important for other States to articulate their *opinio juris* on the status of sea drones, so that the development of the law does not default to an expansive interpretation driven primarily by the interests of powerful navies.

Finally, the humanitarian aspects of sea drones' operation and compliance with the fundamental principles governing armed conflicts (e.g., distinction, precaution, proportionality and military necessity), not only at sea but in all domains, should guide their regulation and use. It is noteworthy that some possible regulatory solutions for sea drones already exist – given their resemblance to traditional means of naval warfare such as naval mines and torpedoes, rules governing the latter may be relevant. In any event, with sea drones' continued development, the law of naval warfare must likewise adapt to safeguard the humanitarian principles that protect life in armed conflicts.

110 For example, a sea drone may qualify as a warship under section 3.2.1 of the 2025 Newport Manual (as unmanned and remotely operated platforms are included), whereas section 6.7 of the Manual treats similar systems as weapons, seemingly due to operational features such as their "remotely controlled, explosive-laden, expendable" nature – although the Manual does not explicitly identify the criteria on which this classification is based. Newport Manual, above note 25, §§ 3.2.1, 6.7.

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