STATE RESPONSIBILITY IN COMBAT OPERATIONS INVOLVING SEA DRONES[1]

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The rapid development of technology – particularly the emergence of sea drones, a type of maritime autonomous and unmanned system – is reshaping the contours of State responsibility in international law and exposing regulatory gaps. With the advent of autonomous and unmanned sea drones capable of making independent decisions through artificial intelligence (AI), existing legal frameworks have become inadequate. This article examines the basis for State responsibility for combat operations carried out by sea drones, including internationally wrongful acts. The article will also address the question of who should be held responsible for any mistakes made – military commanders, designers, manufacturers, or suppliers. The discussion focuses on acts in violation of international law, and the possibility of attributing that violation to a subject of international law, i.e., a State. The key challenge in the case of maritime autonomous and unmanned systems is precisely the attribution of their actions. This article therefore seeks to determine whether existing doctrines of attribution and control can accommodate the operational realities of autonomous maritime warfare, or whether a new paradigm of State responsibility is required. The central research question concerns the State's responsibility in scenarios in which a sea drone controlled by an algorithm takes actions not intended by the State or that exceed the objectives set by the commander. The analysis considers the Articles on Responsibility of States for Internationally Wrongful Acts and examines the issue of "effective" control as articulated in

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the case concerning Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America). *The research methods employed include the legal-doctrinal, normative, and descriptive approaches. The article concludes that sea drones are transforming the conduct of warfare, which necessitates the redefinition of State responsibility under the existing legal framework by closing the regulatory gap.*

Keywords: *sea drones; autonomous maritime systems; unmanned maritime systems; naval warfare; responsibility.*

1. INTRODUCTION

Technological innovation, particularly in artificial intelligence (AI), is expected to continue accelerating,[2] affecting both civilian and military spheres. Among the applications of these new technological solutions are autonomous and unmanned systems, of which sea drones are an example. Undeniably innovative and cheaper than manned warships or aircraft, as they do not require a crew or space for a crew, these systems are revolutionising warfare at sea. Their unmanned nature makes them especially valuable during missions that are "boring, dirty, or dangerous",[3] and they can also operate effectively in adverse weather and in conditions of poor visibility. Moreover, they enjoy varying levels of operational autonomy, which shape their rights and obligations under international law, as well as the legal consequences for the States that deploy them. For the purposes of this article, sea drones will be treated as a separate analytical category relevant to State responsibility. The analysis will focus primarily on fully autonomous maritime systems (weapons).

Given the rapid development of artificial intelligence over the last few years, sea drones are likely to become increasingly autonomous and capable of making independent decisions. This raises a key question: who should be held accountable for any errors they make – military commanders, designers, manufacturers, or suppliers? Assigning responsibility to a specific State is also crucial. One advantage of this approach is that the designated State would be required to adhere to

[2] Bengio, Y. *et al*., International Scientific Report on the Safety of Advanced AI: Interim Report, AI Seoul Summit, May 2024, p. 9 *et seq*., p. 13, https://assets.publishing.service.gov.uk/media/6716673b96def6d27a4c9b24/international_scientific_report_on_the_safety_of_advanced_ai_interim_report.pdf (accessed 22 March 2026).

[3] O'Rourke, R., Navy Large Unmanned Surface and Undersea Vehicles: Background and Issues for Congress, Congressional Research Service, updated 25 March 2025, p. 1, https://www.congress.gov/crs_external_products/R/PDF/R45757/R45757.78.pdf (accessed 22 March 2026).

international law and to prevent its violation. Furthermore, States are the primary actors that purchase and deploy sea drones for use by their armed forces, and they have the financial capacity to cover related costs and compensation. Despite the strength of the above arguments, the potential enforceability of this liability is uncertain.[4]

For these reasons, this article examines State responsibility in deploying sea drones. It argues that existing rules of State responsibility still apply to sea drones, but only in a limited and imperfect way, as attribution becomes increasingly difficult with the greater autonomy of drones. Nevertheless, this article sets the hypothesis that sea drones do not need a new system of State responsibility, but rather a new understanding of how current rules apply to autonomous maritime operations. This will eliminate the regulatory gap in this area.

The remainder of this article proceeds as follows. First, it introduces sea drones as a technological innovation. It then examines the premises for and challenges of attributing the combat activities of a specific sea drone, including autonomous sea drones capable of making independent decisions through artificial intelligence, to a particular State. Finally, it concludes that although sea drones bring unprecedented technological and operational challenges, the international responsibility of States for their use in combat can be grounded in an expanded understanding of "effective control" that encompasses the design, programming, and deployment of autonomous maritime systems.

2. THE CHARACTERISTICS OF SEA DRONES

Determining the legal status of sea drones requires historical context. The first significant use of drones was in Operation CROSSROADS, conducted during the summer months of 1946. This was the first series of nuclear tests conducted at sea, one in the atmosphere and one underwater, with payloads very similar to those dropped on Nagasaki in 1945. One purpose of the tests was to assess the effects of nuclear weapons on ships. The numbers involved in the operation are impressive: 45,400 people, 220 ships, 90 target ships, and 160 aircraft. The task for the sea drone prototypes, there referred to as drone boats, was to collect water samples and test radiation intensity.[5]

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[4] Hammond, D. N., Autonomous Weapons and the Problem of State Accountability, *Chicago Journal of International Law,* vol. 15 (2015), no. 2, p. 657.

[5] US Defense Threat Reduction Agency, Fact Sheet: Operation CROSSROADS, September 2021, https://www.dtra.mil/Portals/125/Documents/NTPR/newDocs/2-CROSSROADS%20-%20 2021.pdf (accessed 14 February 2026).

The second use of drones worth mentioning was during the US military intervention in South Vietnam starting in 1965. Motorised, fibreglass, remote-controlled minesweepers with steel hulls and twin propellers were used to reduce troop losses and make mine neutralisation even more effective.[6] Another example of similar systems used within the last few decades is the Remote Minehunting System developed in the 1990s. Its unique feature was remote control from manned surface vessels.[7] Unmanned submarines also proved invaluable during Operation Iraqi Freedom in 2003, including for mine clearance.[8] This historical progression shows how unmanned maritime systems have gradually evolved from simple remote-controlled tools to increasingly independent platforms, making it all the more necessary to examine their defining characteristics, especially their autonomy.

It would be remiss not to mention the events of the past few years, which have been of particular significance to the development of sea drones. The date 24 February 2022 is significant, since it is regarded as the start of the Russian Federation's full-scale invasion of Ukraine. During the first few weeks, the Ukrainian Navy suffered heavy losses and was almost completely destroyed.[9] Nevertheless, the use of sea drones succeeded in cutting off Russia's access to the sea. These operations were often carried out in conjunction with unmanned aerial vehicles and anti-ship missiles. A closer examination of individual military engagements reveals that it was autonomous maritime systems that were primarily responsible for these outcomes. Another notable success was the maintenance of grain exports from Ukraine.[10] The use of sea drones in Ukraine has evolved as follows: from single-use explosive boats to platforms capable of laying sea mines, shooting down aircraft, and carrying out other operational tasks. Among

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6 Marolda, E. J.; Dunnavent, R. B., The US Navy and the Rivers of Vietnam, in: Marolda, E. J.; Dunnavent, R. B. (eds.), *Combat at Close Quarters: Warfare on the Rivers and Canals of Vietnam*, Naval History & Heritage Command in partnership with the Naval Historical Foundation, Department of the Navy, Washington, DC, 2015, p. 29.

7 Letts, D.; Pedrozo, R. P., Maritime Drones at War: Legal Issues Affecting Characterization and Use, in: Klein, N.; Guilfoyle, D.; Karim, M. S.; McLaughlin, R. (eds.), *Maritime Autonomous Vehicles and International Law: Maritime Security Perspectives*, Routledge, London, 2024, pp. 103-124.

8 US Department of the Navy, The Navy Unmanned Surface Vehicle (USV) Master Plan, 23 July 2007, p. 3, https://apps.dtic.mil/sti/tr/pdf/ADA504867.pdf (accessed 14 February 2026).

9 The International Institute for Strategic Studies (IISS), *The Military Balance 2024,* IISS, London, February 2024, p. 213, quoted from: Clare, T. C., A Navy of Necessity: Ukraine's Unmanned Surface Vessels at War, Center for Strategic and Budgetary Assessments (CSBA), 2025, p. 4, https://csbaonline.org/wp-content/uploads/2026/04/CSBA8411_Navy_of_Necessity_Report_Final_Web.pdf (accessed 14 February 2026).

10 Clare, T. C., A Navy of Necessity…, *op. cit*., p. 16.

their advantages, which are becoming increasingly apparent in the course of the ongoing war, are the speed of construction (in the case of a simple sea drone), the absence of full autonomy and, consequently, the reduced risk of the system being captured by the enemy, greater manoeuvrability and flexibility of movement compared with traditional warships, and the element of surprise arising from the use of innovative technology.[11]

The above examples justify the choice of sea drones as the subject of this study, given the rapid development of these systems, their successful deployment during the war in Ukraine, and the author's conviction that they are unique compared with autonomous systems in the domains of air, land, and space, as they are transforming the way combat operations are conducted and the methods previously employed.

The concept of sea drones does not yet have a clear conceptual framework.[12] It encompasses two main characteristics: autonomy and manning.[13] The latter simply refers to the presence or absence of a human on board; thus, because there is no onboard crew, they are unmanned.[14] The concept that requires more detailed analysis is autonomy, as sea drones operate through digital systems.[15]

Autonomy indicates a craft's ability to operate independently of human interaction.[16] This means that sea drones can operate without external intervention,

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11 *Ibidem*, pp. 18-20.

12 Stępień, B., Sea Drones: Warships or Weapons? Legal Status and Implications, *International Review of the Red Cross*, vol. 108 (2026), no. 931, pp. 574-594.

13 Similar challenges emerge in the case of maritime autonomous and unmanned systems in civilian applications. See Stępień, B., Can a Ship Be Its Own Captain? Safe Manning of Autonomous and Uncrewed Vessels, *Marine Policy*, vol. 148 (2023), pp. 2-5; Stępień, B., Towards a New Horizon: 1972 COLREG in the Era of Autonomous Ships, *Ocean Development & International Law*, vol. 55 (2024), no. 1-2, pp. 173-175.

14 Orye, E.; Visky, G.; Rohl, A.; Maennel, O., Enhancing the Cyber Resilience of Sea Drones, in: Kwan, C. *et al*. (eds.), *CyCon 2024: Over the Horizon 16th International Conference on Cyber Conflict*, Tallinn, 2024, p. 84.

15 In this context, the cybersecurity of these systems must also be considered. Readers interested in this topic may consult Stępień, B., Defending the Fleet: Cybersecurity and Autonomous Ships, in: Kamiński, T.; Karski, K. (eds.), *40 Years of the United Nations Convention on the Law of the Sea: Assessment and Prospects*, 1st Edition, Routledge, London, 2025, pp. 334-344.

16 In military terminology, however, it is used to quantify the distance that a given vehicle or munition can travel. See Furgolle, G., Autonomous Systems in the Underwater Domain: A Limitless Revolution?, *Focus stratégique*, No. 131, Ifri, January 2026, p. 11, https://www.ifri.org/en/studies/autonomous-systems-underwater-domain-limitless-revolution (accessed 22 March 2026).

which requires them to understand their surroundings beforehand and adapt to any changes. Three main levels of autonomy can be distinguished. The first is a remotely controlled system which has zero autonomy. The second is a partially autonomous system which has limited ability to adapt to the external environment. The last is a fully autonomous sea drone, with no human involvement in decision-making.[17] It should be noted, however, that "[r]eferring to autonomy as a general attribute of systems is imprecise, if not meaningless, as the nature of human–machine command-and-control relationships and the sophistication of a machine's decision-making capability may vary from one function to another".[18]

Sea drones can be launched from ships or aircraft, and may be regarded as extensions of the launch platform.[19] Various categories and classifications of sea drones have emerged from their rapid technological development. For example, Letts and Pedrozo propose their classification into four categories: very small, with a length of 7 metres or less; small, with a length of 7 to 12 metres; medium, with a length of 12 to 50 metres; and large, at over 50 metres in length.[20] Other important configurations of sea drones include the following: surface, underwater, military, commercial, large, small, remote-controlled, and automatically navigated.[21] Their main characteristic is that they can operate for long periods without human intervention. Sea drones can operate in aquatic environments, including seas, canals, and rivers. However, the manner and purpose of their operations differ.

State practice varies regarding the application of autonomous and unmanned maritime systems. One example is the US Commander's Handbook on the Law of Naval Operations,[22] which provides a catalogue of sea drone applications, including "intelligence, surveillance, reconnaissance; mine countermeasures; antisubmarine warfare; surface warfare; inspection/identification; oceanography; communication/navigation network nodes; payload delivery; information operations; time-critical strike; barrier patrol and operations; seabase support;

17 *Ibidem*, p. 20 *et seq.*

18 Boulanin, V.; Verbruggen, M., *Mapping the Development of Autonomy in Weapon Systems,* SIPRI, Solna, Sweden, 2017, p. 113.

19 Dean, S. E., Naval Fleet Protection Technologies, *European Security & Defence (ESD),* 21 May 2024, https://euro-sd.com/2024/05/articles/38110/naval-fleet-protection-technologies/ (accessed 22 March 2026).

20 Letts, D.; Pedrozo, R. P., Maritime Drones at War…, *op. cit*., p. 106.

21 Orye, E.; Visky, G.; Rohl, A.; Maennel, O., Enhancing the Cyber Resilience of Sea Drones, *op. cit*., p. 85.

22 US Department of the Navy, *The Commander's Handbook on the Law of Naval Operations*, Navy Warfare Development Command, Norfolk, 2022, pp. 2-4.

electronic warfare; laying underwater sensor grids, sustainment of at sea operating areas, bottom mapping and survey; special operations".[23]

The most salient characteristic of sea drones for the purpose of determining State responsibility for their acts is their reliance on AI. To properly contextualise the analysis, two key concepts must be clarified: foreseeability and due diligence, with the first concept serving as a prerequisite for the second. These have been the main elements of liability doctrines. Foreseeability means that if a risk cannot be foreseen or is negligible, then no liability would be imposed. Due diligence indicates the need to exercise an appropriate degree of caution. Both apply a "reasonable person" standard, requiring conscious intent and moral judgement, neither of which is held by artificial intelligence models. It follows, therefore, that standard product liability cannot be applied in this case. Thus, the AI design process is crucial, at which stage steps must be taken to ensure safety and anticipate foreseeable risks in order to eliminate or minimise them. Such potential risks include disinformation and bias. It must be noted, however, that certain standards of product liability could be compared to standards of international liability. These include, for example, foreseeability and safety in the design phase. The State's duty of due diligence, on the other hand, involves testing, validation, and continuous monitoring. Some correlation can be seen between these issues, and hence it can be concluded that certain common objectives exist in both product liability and international liability.

It is also crucial to determine whether false or inaccurate content constitutes a foreseeable consequence of using artificial intelligence. Artificial intelligence systems must be tested beforehand to assess foreseeability, and measures should be taken to prevent unpredictable behaviour by the algorithm. This is provided for in Article 36 of Additional Protocol I (1977) to the 1949 Geneva Conventions on new types of weapons.[24] It should be noted, however, that this provision is not customary law, but rather good and recommended practice followed by many States.[25] A similar view can be found in the Report of the 2019 session of

[23] *Ibidem*, pp. 2-4, 2-5.

[24] Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977. It is worth recalling the definition here: "Weapons comprise, in addition to arms, those tools and devices that are used, constructed, or adapted with a view to killing, harming, disorientating, or incapacitating a person, or for damaging or even destroying buildings or matériel". See Casey-Maslen, S., *Arms Control and Disarmament Law*, Oxford University Press, Oxford, 2021, p. 2.

[25] Dinstein, Y., *The Conduct of Hostilities under the Law of International Armed Conflict*, 4th Edition, Cambridge University Press, Cambridge, 2022, p. 115.

the Group of Governmental Experts on Emerging Technologies in the Area of Lethal Autonomous Weapons Systems.

A new applicable rule is that State due diligence, for the purposes of attribution and responsibility, includes the obligation to ensure that the design, training, and testing of sea drone algorithms minimise the foreseeable risks of violations of international humanitarian law (IHL)/law of the sea.

A distinctive feature of AI is that its results are often surprising and difficult to predict (e.g., the black-box problem[26]). Therefore, when testing, statistical probability should be applied, and gaps and vulnerabilities should be identified. Implementing due diligence involves, for example, informing users about risks and search imperfections, which is a dynamic process. This suggests that AI developers/providers have a duty of due diligence of a preventive and precautionary nature.[27] Our focus here, however, is on State responsibility for due diligence in light of these characteristics of AI.

This technological diversity underscores that any legal assessment of sea drones ultimately turns on how their capabilities and levels of autonomy shape questions of attribution and related consequences. Such considerations show that the technical unpredictability of autonomous systems directly affects how responsibility must be assessed, making it necessary to examine how international law attributes conduct to States.

3. INTERNATIONAL RESPONSIBILITY OF STATES

Public international law concerns the mutual relations between States that are sovereign, equal before the law, and independent.[28] As is well established both in customary international law and in the literature, the constituent elements of a State are: population, territory, authority, and the capacity to maintain relations.[29] The 1933 Montevideo Convention stipulates that, under international

[26] Brożek, B.; Furman, M.; Jakubiec, M.; Kucharzyk, B., The Black Box Problem Revisited. Real and Imaginary Challenges for Automated Legal Decision Making, *Artificial Intelligence and Law*, vol. 32 (2024), no. 2, pp. 427-428.

[27] Irfan, M.; Patel, J.; Zhao, L., Safety by Design for Generative AI: Foreseeability and Duty of Care in Product Liability, *International Journal of Law, Policy and Scientific Research (IJLPSR)*, vol. 1 (2025), no. 1, p. 24 *et seq.*

[28] Góralczyk, W.; Karski, K.; Sawicki, S. (eds.), Cechy charakterystyczne prawa międzynarodowego, in: *Prawo międzynarodowe publiczne w zarysie*, Wolters Kluwer, Warsaw, 2024, pp. 25-28.

[29] Hall, W. E., *International Law,* Clarendon Press, Oxford, 1880, p. 15.

law, a State is a single legal entity. Article 3 is also significant, reading as follows: "The political existence of the state is independent of recognition by the other states. Even before recognition the state has the right to defend its integrity and independence, to provide for its conservation and prosperity, and consequently to organize itself as it sees fit, to legislate upon its interests, administer its services, and to define the jurisdiction and competence of its courts. The exercise of these rights has no other limitation than the exercise of the rights of other states according to international law".[30]

Given this understanding of statehood, the next step is to consider the legal environment in which States operate and the mechanisms through which their conduct is regulated and assessed. At the international level, there is no universal legislative body to form a global, shared legal framework.[31] International law is primarily created through the application of treaty provisions. Furthermore, the conclusion of agreements between States or the adoption of certain practices may lead to the creation of customary law.[32]

Within this framework, the question becomes how international law evaluates States' conduct and determines when it gives rise to responsibility.[33]

The Articles on Responsibility of States for Internationally Wrongful Acts are often treated in case law as a codification of customary law. Work on this document was completed with the adoption of Resolution 56/83 of 12 December 2001 by the United Nations General Assembly.[34] State responsibility is undoubtedly

[30] Montevideo Convention on the Rights and Duties of States, 26 December 1933.

[31] Nor is it the United Nations, despite bringing together as many as 193 countries. Nevertheless, it has the right to use coercion through Security Council decisions against a State that has threatened or violated peace. A separate issue is the composition of the permanent members and tensions between China and Russia on the one hand and the United States on the other, as well as the right of veto, which significantly hinders the real effectiveness of the UN.

[32] Góralczyk, W.; Karski, K.; Sawicki, S. (eds.), Tworzenie prawa międzynarodowego (brak ustawodawcy), in: *Prawo międzynarodowe publiczne w zarysie*, Wolters Kluwer, Warsaw, 2024, p. 26.

[33] In general terms, responsibility in international law can be divided into responsibility for violating international law and liability for the consequences of acts that do not violate international law. See Kałduński, M.; Symonides, J., Dwie koncepcje odpowiedzialności, in: Bierzanek, R.; Symonides, J.; Kałduński, M.; Balcerzak, M. (eds.), *Prawo międzynarodowe publiczne*, Wolters Kluwer, Warsaw, 2023, p. 197.

[34] Website containing the text of Resolution 56/83, https://docs.un.org/en/a/RES/56/83 (accessed 3 December 2025).

one of the most important principles of international law.[35] An analysis of the above legal instrument leads to several conclusions. Its structure consists of four main parts, with a total of fifty-nine articles. The first part defines the grounds for State responsibility. Article 2 establishes that for there to be an internationally wrongful act there must be conduct consisting of an action or omission that 1) is attributable to a State, and 2) constitutes a breach of an international obligation of the State.[36] Article 4 provides for the perception of the State as an indivisible whole.[37] This establishes the international responsibility of States for the actions or omissions of their legislative authorities. Thus, a parliament can commit an international tort when it passes a law that is not in line with the State's international obligations.[38] Another important provision is Article 7, which stipulates that even if someone exceeds their authority or violates instructions when acting in the capacity of an organ, person, or entity authorised to exercise public authority, it is still considered an act of the State under international law.[39] Article 16 addresses the concept of aiding and abetting in criminal law, indicating that a State that knowingly assists in the commission of an internationally wrongful act also bears international responsibility.[40] This rule also applies to direction and control, as defined in Article 17.[41]

A question arises about which circumstances exclude unlawfulness. Article 20 concerns the consent of one State to another, which must take place within the limits of consent since actions that exceed these limits are considered unlawful.[42] Another circumstance excluding unlawfulness is self-defence, but only if exercised in accordance with the Charter of the United Nations.[43] *Force majeure* is another factor that can eliminate the unlawfulness of a given act, but it cannot be

[35] Some scholars argue that international responsibility shares characteristics with civil liability under domestic law. See Ciechanowicz-McLean, J., Odpowiedzialność państw za szkody wyrządzone w środowisku morskim w międzynarodowym prawie morza, *Gdańskie Studia Prawnicze*, Rzymskie prawo morskie, tradycje prawa morskiego oraz prawo współczesne, vol. 43 (2019), no. 3, pp. 191-202.

[36] Resolution 56/83, Article 2.

[37] Resolution 56/83, Article 4.

[38] Kałduński, M.; Symonides, J., Odpowiedzialność za delikt *(responsibility)*, in: Bierzanek, R.; Symonides, J.; Kałduński, M.; Balcerzak, M. (eds.), *Prawo międzynarodowe publiczne*, Wolters Kluwer, Warsaw, 2023, p. 197.

[39] Resolution 56/83, Article 7.

[40] Resolution 56/83, Article 16.

[41] Resolution 56/83, Article 17.

[42] Resolution 56/83, Article 20.

[43] Resolution 56/83, Article 21.

applied if the situation of *force majeure* was caused by the actions of the State requesting its application. It also does not apply if the State was aware of the risk.[44]

In Part II, Chapter I, Article 30 lays down that a continuing internationally wrongful act must cease and assurances must be given that it will not be repeated.[45] Article 31, which establishes the obligation to fully repair the damage caused as a result of an internationally wrongful act, is important to this analysis.[46] The forms of reparation have also been specified as follows: restitution, compensation, and satisfaction (e.g. admission of guilt, regret, apology), and they may apply singly or in combination.[47]

The issue of the attribution of an internationally wrongful act is addressed in the judgment of the International Court of Justice (ICJ) of 26 February 2007 in the case of *Bosnia and Herzegovina v. Serbia and Montenegro*.[48] The grounds for the ruling were violations of the Convention on the Prevention and Punishment of the Crime of Genocide of 9 December 1948,[49] specifically Article IX of this instrument. It states that "Disputes between the Contracting Parties relating to the interpretation, application or fulfilment of the present Convention, including those relating to the responsibility of a State for genocide or for any of the other acts enumerated in article III, shall be submitted to the ICJ at the request of any of the parties to the dispute".[50] Article III enumerates the following criminal offences: genocide, conspiracy to commit genocide, direct and public incitement to commit genocide, attempt to commit genocide, and complicity in genocide.[51]

44 Resolution 56/83, Article 23.

45 Resolution 56/83, Article 30.

46 Resolution 56/83, Article 31.

47 Resolution 56/83, Article 34. When considering how these provisions apply to damage caused by combat operations involving sea drones and the international responsibility of States for such damage, such operations should not be viewed in the same light as domestic criminal law. See Perez-Leon-Acevedo, J. P., Rethinking Attribution Standards for State Responsibility Concerning Mass Atrocities, *San Diego International Law Journal*, vol. 26 (2025), no. 2, p. 183.

48 International Court of Justice, *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro)*, https://www.icj-cij.org/case/91 (accessed 21 February 2026).

49 International Humanitarian Law Databases, Convention on the Prevention and Punishment of the Crime of Genocide, 9 December 1948, https://ihl-databases.icrc.org/en/ihl-treaties/genocide-conv-1948 (accessed 14 February 2026).

50 International Humanitarian Law Databases, Convention on the Prevention and Punishment of the Crime of Genocide, 9 December 1948, Article IX.

51 International Humanitarian Law Databases, Convention on the Prevention and Punishment of the Crime of Genocide, 9 December 1948, Article III.

However, analysing the atrocities that took place throughout Bosnia and Herzegovina, the Court concluded that there was no specific intention to destroy, in whole or in part, a specific group of people. The massacre in Srebrenica, on the other hand, did meet these criteria, as it was directed against Bosnian Muslims.[52] Another argument supporting the view that this crime was genocide is the fact that the Republic of Serbia did not prevent the massacre. Article I of the Convention clearly states that "The Contracting Parties confirm that genocide, whether committed in time of peace or in time of war, is a crime under international law which they undertake to prevent and to punish".[53] Thus, the law was violated.[54]

When analysing this issue, the question arises as to how the requirement for "specific intent" translates into a context where an operational decision is made by software. The answer is not clear-cut, given the question of who should be held responsible for that intent. This is all the more so when considering a situation in which the algorithm operates in a partially unpredictable manner.

A further illustration of how international law approaches attribution, especially in situations involving indirect or technologically mediated conduct, can be found in the case of *Nicaragua v. United States of America*. Nicaragua achieved independence from Spain in 1821; however, it remained significantly dependent on the United States. The United States exerted influence over presidential elections in return for financial support, such as loans. Its interests included banana plantations and the strategic potential of canal routes. In 1927, to stabilise Nicaragua's internal civil war, an agreement was reached for the US to supervise the 1928 election to ensure fairness, and a non-partisan Nicaraguan National Guard was established as the only armed force in Nicaragua. Its commander was Anastasio Somoza, who later took advantage of his control of the National Guard to impose a 43-year Somoza family dictatorship. Farmers, students, and the middle class soon united against their rule and formed the socialist Sandinista movement, leading to another civil war. In 1979, the Sandinistas prevailed and formed a government that initiated agricultural and other reforms. Opponents known as the Contras soon emerged

[52] UN International Residual Mechanism for Criminal Tribunals, Srebrenica: Timeline of a Genocide, https://www.irmct.org/specials/srebrenica/timeline/en (accessed 20 February 2026).

[53] International Humanitarian Law Databases, Convention on the Prevention and Punishment of the Crime of Genocide, 9 December 1948, Article I.

[54] International Court of Justice, *Application of the Convention on the Prevention and Punishment of the Crime of Genocide (Bosnia and Herzegovina v. Serbia and Montenegro)*, https://www.icj-cij.org/case/91 (accessed 21 February 2026).

and were supported by US President Ronald Reagan. However, the Sandinista party retained power.[55]

This brief historical overview sets the stage for discussing the mentioned ICJ judgment. On 9 April 1984, Nicaragua filed a petition to initiate proceedings against the United States of America for its support of the Contras. A month later, the Court issued a ruling on provisional measures, which included the immediate cessation of activities that would restrict access to Nicaraguan ports and the suspension of the use of mines. First, the Court's jurisdiction was examined, and Nicaragua's application was found to be admissible. On 18 January 1985, the United States indicated that it would not participate in further proceedings in this case. The merits of the case were decided by the judgment of 27 June 1986. It was ruled that the United States had violated customary international law by "interfering in the affairs of another state, using force against another state, violating the sovereignty of another state, and disrupting peaceful maritime trade".[56] A violation of the bilateral Treaty of Friendship, Trade and Navigation of 1956 was also found. The judgment called for the repair of all injury caused to Nicaragua.[57] In the context of sea drones, this means that State responsibility does not depend on control over a single algorithmic action, but on control over the entire operation, including the design and implementation of the autonomous system. Formulating the principles for controlling autonomous systems is a new issue compared to controlling paramilitary forces. Key aspects to consider include technical architecture, training data, and algorithmic rules for conducting military operations. Control therefore begins as early as the design and implementation stages, which is an advantage for the subsequent operational security of such a system.

In the context of sea drones, paragraph 115 of the above-mentioned ruling is key. It reads as follows: "The Court has taken the view (paragraph 110 above) that United States participation, even if preponderant or decisive, in the financing, organizing, training, supplying and equipping of the contras, the selection of its military or paramilitary targets, and the planning of the whole of its operation, is still insufficient in itself, on the basis of the evidence in the possession of the Court, for the purpose of attributing to the United States the acts committed by the contras in the course of their military or paramilitary operations in Nicaragua. All the forms of United States participation mentioned above, and

[55] American Archive of Public Broadcasting, Nicaraguan Revolution (1978-1990), https://americanarchive.org/exhibits/newshour-cold-war/nicaragua (accessed 22 February 2026).

[56] International Court of Justice, *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America)*, https://www.icj-cij.org/case/70 (accessed 25 February 2026).

[57] *Ibidem*.

even the general control by the respondent State over a force with a high degree of dependency on it, would not in themselves mean, without further evidence, that the United States directed or enforced the perpetration of the acts contrary to human rights and humanitarian law alleged by the applicant State. Such acts could well be committed by members of the contras without the control of the United States. For this conduct to give rise to legal responsibility of the United States, it would in principle have to be proved that that State had **effective control** of the military or paramilitary operations in the course of which the alleged violations were committed".[58] In view of the above, it can be concluded that if a State exercises effective control over certain military or paramilitary operations, it is responsible for the actions taken in those operations, as well as for violations of international obligations and for injury caused to another State.

A further example is the United States' reaction following the bombing of the Chinese embassy in Belgrade in 1999. As a result of this incident, three Chinese nationals were killed and many were injured. According to the Americans, it was a mistake; the Chinese, however, view it as a deliberate attack. On 7 May, an American bomber was due to deliver five bombs to the Federal Directorate for Supply and Procurement for the Yugoslav Army. According to the United States, the attack on the embassy was caused by faulty maps and a flawed target selection process. The bombs struck, among other places, the defence attaché's office and the ambassador's residence.[59] The US government paid compensation to the victims' families and covered the costs of repairing the embassy. This is consistent with the principle that redressing the damage should, as far as possible, eliminate all the consequences of the wrongful act and restore the situation to the *status quo ante*. This definition has also been endorsed by international tribunals and human rights committees.[60]

An important related issue is the six-step process for determining the objectives of international humanitarian law. This process is useful for identifying who should be held responsible for a given internationally wrongful act.[61]

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58 *Ibidem*, para. 115.

59 Moore, G. J., Not Very Material but Hardly Immaterial: China's Bombed Embassy and Sino-American Relations, *Foreign Policy Analysis*, vol. 6 (2010), no. 1, p. 28.

60 Crawford, J., *State Responsibility: The General Part*, Cambridge University Press, Cambridge, 2013, pp. 480-481.

61 Henderson, I., *The Contemporary Law of Targeting: Military Objectives, Proportionality and Precautions in Attack under Additional Protocol I*, Martinus Nijhoff Publishers, Leiden, 2009, p. 242.

Taken together, these findings underscore that the fundamental issue concerning sea drones is not their technological innovation, but whether a State can be shown to exercise effective control over their deployment and operation. This assessment ultimately determines international responsibility. The cases in question demonstrate that attribution in international law depends not on the novelty of the means used, but on the degree of control exercised by a State over the relevant conduct. In Bosnia, the Court required proof of specific intent and direct involvement; in Nicaragua, it mandated effective control over the operations in which the wrongful acts occurred. Applied to sea drones, these standards imply that responsibility is not contingent upon whether a system is autonomous, remotely operated, or AI-enabled, but rather on whether the State designed, programmed, deployed, or directed the operation resulting in harm. Even if a sea drone makes certain decisions independently, the State remains liable if it exercised effective control over the mission parameters, technological architecture, or operational environment that facilitated the wrongful act. Consequently, the jurisprudence of the ICJ supports the conclusion that autonomy does not break the chain of attribution; it merely shifts the focus from immediate human control to the broader control structures exercised by States over autonomous maritime systems.

One possible new principle could be to extend the concept of "effective control" to the stages of design, programming, testing, and the definition of mission parameters, in view of rapid technological progress and Article 36 of Protocol I to the Geneva Conventions.

4. FINAL REFLECTIONS: CAN STATES BE HELD RESPONSIBLE FOR THE COMBAT OPERATIONS OF SEA DRONES?

The innovative technology behind sea drones raises serious questions about State responsibility for their actions. Regardless of whether sea drones are classified as weapons, vessels, or a new type of warship, they are the technological future of the armed forces. The leaders in this technological race will gain a significant advantage over others, particularly in the development of fully autonomous systems. The complex issue of attributing responsibility for the combat operations of sea drones requires urgent international reflection and the development of the best solutions.

Bringing together the legal principles and technological considerations discussed above allows for a final assessment of how State responsibility applies

to the combat use of sea drones. Responsibility for their combat operations, depending on their level of autonomy, could be structured as follows. In the case of remotely controlled systems, States could be held liable due to the human factor involved (a member of the State's armed forces). As for sea drones with a higher degree of autonomy, liability could be determined based on human oversight and the negative consequences that might have been foreseen but were not. However, to determine the liability of fully autonomous sea drones, consideration should be given to whether due care was exercised in their programming and whether proper control over the algorithms was maintained. As they increasingly rely on artificial intelligence, their behaviour raises additional questions about foreseeability, predictability, and the standard of care expected of those who design and deploy them.

Considering all the legal instruments cited in this paper, there are many indications that it is the States that should bear international responsibility for the combat operations of sea drones.[62] Commanders of armed forces are subordinate to States, while manufacturers and suppliers (in the case of fully autonomous sea drones) manufacture or supply these autonomous craft to the State under specific contracts; hence, the State is aware of the purchase and its potential negative consequences. This suggests that responsibility should follow the chain of authority and control, even when the technology introduces layers of autonomy between human decision-makers and operational outcomes.

Thus, the most realistic solution is to extend the doctrine of effective control so that it encompasses control over the design, programming, and implementation of algorithms, and not merely over the physical use of the weapon.

[62] See also the Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), 8 June 1977. Additional Protocol I, Article 48 stipulates the need to distinguish between civilians and combatants, as well as between civilian objects and military objectives. Furthermore, it clearly states that the belligerent parties may target only military objectives. The following article provides a legal definition of "attacks", i.e. defensive or offensive acts of violence against an opponent. Additional Protocol I, Article 49(3) specifies that the provisions of Section I of Part IV apply to all hostilities on land, in the air, and at sea that affect the civilian population or civilian objects on land. They are also used for attacks from sea or air against land targets. However, it is noteworthy that the above provisions do not apply to conduct at sea in the following configurations: air-to-air attack by a military aircraft against another aircraft, air-to-sea attack by a military aircraft attacking a warship, sea-to-air attacks, and sea-to-sea attacks using a warship or submarine that engages in actions against another warship or submarine. See Kraska, J., Distinction, Proportionality, and Precautions in Attacks at Sea in the New Era of the Law of Naval Warfare, *Chicago Journal of International Law,* vol. 26 (Summer 2025), no. 1, pp. 396-397.

There are also three main procedural solutions for how a State could be held accountable in the case of a sea drone violation. One potential approach is for the State whose citizen has suffered a violation to bring an action before the International Court of Justice, which is the principal judicial organ of the United Nations, established in 1945. Its functions are to settle international disputes and to give advisory opinions. Importantly, its judgments are final. Article 36(1) of the Statute of the ICJ stipulates that the Court shall have jurisdiction over disputes submitted to it by the parties, i.e. States, and over matters specified in the Charter of the United Nations or in treaties and conventions in force.[63] Paragraph 2 regulates the recognition of the jurisdiction of the ICJ by States in matters such as "the interpretation of a treaty, any question of international law, the reality of any fact which, if established, would constitute a breach of an international obligation, the nature or extent of the compensation due for the breach of an international obligation".[64] However, the optional clause mechanism described in this provision is legally unstable and fluid.[65] The ICJ could therefore rule on inter-State disputes concerning the use of force or breaches of international humanitarian law.

Another potential solution would be for a natural person to bring an action before a national court on the grounds of a prohibited act, such as serious injury to health, death, or property damage.[66] However, State immunity is a significant problem, and therefore this approach seems unlikely to be effectively enforced in the coming years. The third method is to bring a case before tribunals that protect human rights. These include the European Court of Human Rights, the African Court on Human and Peoples' Rights, and the Inter-American Court of Human Rights. The scope of the case would concern civilian casualties resulting from attacks carried out using sea drones. Taken together, these avenues illustrate that while legal mechanisms exist, their effectiveness depends on whether the conduct of sea drones can be attributed to a State under international law.

In conclusion, the emergence of sea drones, ranging from remotely operated platforms to systems capable of increasingly autonomous decision-making, poses challenges that existing legal frameworks were not designed to address. Yet these challenges do not render the current law obsolete. Rather, they require a more technologically informed interpretation of long-standing principles of State

[63] International Court of Justice, Statute of the International Court of Justice, Article 36(1), https://www.icj-cij.org/statute (accessed 22 January 2026).

[64] International Court of Justice, Statute of the International Court of Justice, Article 36(2).

[65] Szafarz, R., Obowiązkowa jurysdykcja Międzynarodowego Trybunału Sprawiedliwości na podstawie klauzuli fakultatywnej, *Państwo i Prawo*, no. 2, 1989, pp. 57-63.

[66] Hammond, D. N., Autonomous Weapons and the Problem of State Accountability, *op. cit*., p. 657.

responsibility, thereby closing the regulatory gap. Independent of a sea drone's legal status, its deployment remains embedded in structures of State authority, procurement, command, and oversight. For this reason, the most coherent and legally defensible approach is to extend the doctrine of effective control to encompass not only the physical use of the system but also control over its design, programming, testing, and operational parameters. Only by recognising this broader notion of control can international law meaningfully attribute conduct involving autonomous maritime systems to States. As the capability of sea drones increases and as they become more widely used, the need to clarify these standards grows all the more urgent. It is ultimately the States that must bear responsibility for the consequences of the technologies they choose to develop, deploy, and rely on. This is also important in terms of the broader concepts of security and social justice. Clarifying these issues will also ensure consistency in the application of procedures.

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Sažetak:

ODGOVORNOST DRŽAVE U BORBENIM OPERACIJAMA KOJE UKLJUČUJU POMORSKE DRONOVE

Brz razvoj tehnologije – osobito pojava pomorskih dronova (sea drones), vrste pomorskih autonomnih i besposadnih sustava – preoblikuje obrise odgovornosti države u međunarodnom pravu i razotkriva pravnu prazninu. Pojavom autonomnih i bespilotnih pomorskih dronova sposobnih za donošenje neovisnih odluka pomoću umjetne inteligencije (UI), postojeći pravni okviri postali su neadekvatni. Ovaj članak ispituje temelj odgovornosti države za borbene operacije koje se provode pomorskim dronovima, uključujući i odgovornost za međunarodno protupravne čine. Rad se bavi i pitanjem tko bi se trebao smatrati odgovornim za greške – vojni zapovjednici, projektanti, proizvođači ili dobavljači. Rasprava je usredotočena na njihove radnje kojima se krši međunarodno pravo te na mogućnost pripisivanja tog kršenja subjektu međunarodnog prava, to jest državi. Ključni izazov u slučaju pomorskih autonomnih i besposadnih sustava upravo je pitanje pripisivanja njihovih čina državi. Stoga se ovim člankom nastoji utvrditi mogu li postojeće doktrine pripisivanja i kontrole obuhvatiti operativnu stvarnost autonomnog pomorskog ratovanja ili je potrebna nova paradigma odgovornosti države. Središnje istraživačko pitanje odnosi se na odgovornost države u slučajevima u kojima pomorski dron kojim upravlja algoritam poduzima radnje koje država nije namjeravala poduzeti ili koje premašuju ciljeve koje je postavio zapovjednik. Analiza uzima u obzir Nacrt članaka o odgovornosti država za međunarodno protupravne čine i ispituje pitanje »efektivne« kontrole kako je formulirano u presudi Međunarodnog suda u predmetu Vojne i paravojne djelatnosti u Nikaragvi i protiv Nikaragve (Nikaragva protiv Sjedinjenih Američkih Država). *U radu su primijenjene istraživačke metode koje uključuju pravno-dogmatski, normativni i deskriptivni pristup. Zaključak je da pomorski dronovi mijenjaju način ratovanja te da je u postojećem pravnom okviru potrebno redefinirati odgovornost države i zatvoriti nastalu pravnu prazninu.*

Ključne riječi: *pomorski dronovi; autonomni pomorski sustavi; besposadni pomorski sustavi; pomorsko ratovanje; odgovornost.*