THE COE FRAMEWORK CONVENTION ON ARTIFICIAL INTELLIGENCE PUT TO THE TEST OF AUTONOMOUS SHIPS

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Abstract

This article examines the potential applicability of the Council of Europe's Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law to the emerging domain of autonomous shipping. While the Framework Convention may represent a significant milestone in the regulation of artificial intelligence, its impact could be constrained by its discretionary application by State parties to private actors and by broad exceptions concerning research, national security, and defence. Both factors are directly relevant to maritime operations. The study investigates whether, and to what extent, the Framework Convention's provisions could apply to the activities of autonomous ships, highlighting interpretative challenges and other problematic aspects that may hinder effective implementation. It also considers possible pathways to overcome these limitations, with the aim of promoting coherent and rights-based governance in this rapidly evolving sector.

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1. Introduction

The recent adoption of the Council of Europe's Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law (Framework Convention) is set to become a significant milestone within the emerging corpus of

international artificial intelligence (AI) regulation. By seeking to reconcile the imperative of mitigating the manifold risks inherent in AI with the equally important objective to realise its transformative potential, the Framework Convention aspires to establish a balanced and rights-based normative framework[1]. As frequently emphasised in scholarly and institutional commentary, upon its entry into force the Framework Convention will represent the first legally binding multilateral instrument specifically dedicated to the governance of AI[2].

Among the peculiar features characterising the Framework Convention, its geographical reach has to be mentioned, being it – at least potentially – relevant *beyond* the territories of the CoE's Member States[3], so is its cross-cutting and general character. In fact, due to the extremely diverse contexts in which AI systems are likely to be deployed in the near future as well as the relevant unpredictability of those developments, the aim of the drafters was to introduce a technology-neutral, flexible and "globally applicable legal framework"[4].

Prima facie, the applicability of the Framework Convention to a wide variety of situations appears to be ensured by the rather broad definition of 'artificial intelligence system' adopted for its

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[1] At the outset of the process that eventually led to the adoption of the Framework Convention, the Ad Hoc Committee on Artificial Intelligence (CAHAI) recognised the need to develop a legal response "aimed at filling legal gaps in existing legislation and tailored to the specific challenges raised by AI systems", which "could also foster and influence AI technologies in line with the above-mentioned standards" (Draft Feasibility Study, Doc. CAHAI-PDG(2020)01rev2, 11 November 2020, para. 3). For further references on the path towards its adoption, see, among others, Morawska (2024) p. 25 ff.; Nardocci (2024) p. 179 ff.; Ziller (2014) p. 210 ff.

[2] Pursuant to its Article 30(3), the Framework Convention shall enter into force on the first day of the month following the expiration of a period of three months after the date on which five signatories, including at least three Member States of the Council of Europe, have ratified, accepted or approved it. The relatively low ratification threshold, arguably the result of a negotiation process marked by a notably participatory and inclusive approach (see in this respect Iermano (2025)), has nonetheless attracted criticism. In particular, Castellaneta (2024) argues that this feature risks undermining the effectiveness of the Framework Convention and rather reflects a desire to secure the adoption of a treaty at any cost, rather than a genuine intent to achieve substantive and effective regulation.

[3] For instance, Presno Linera and Meuwese (2025), p. 18 have likewise underscored the "global ambitions" underlying the Framework Convention.

[4] See the Preamble of the Framework Convention.

purposes[5]. Pursuant to Article 2 of the Framework Convention, an AI system falls within its scope insofar as it is a "machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations or decisions that may influence physical or virtual environments". The provision further specifies that "[d]ifferent artificial intelligence systems vary in their levels of autonomy and adaptiveness after deployment". Accordingly, the definition appears broad enough to encompass activities intended to support or facilitate human action, and not solely those aimed at taking final decisions. As regards the categories of activities potentially encompassed by the Framework Convention, the drafters deliberately refrained from providing an exhaustive list, yet the Explanatory Report (ER) offers a set of illustrative examples that appears rather comprehensive in scope.

At the same time, the Framework Convention has not escaped scholarly criticism, directed in particular at its potentially narrow scope of application, which might ultimately limit its practical impact. On the one hand, States parties would have a wide discretion in deciding whether to apply the Framework Convention to private actors[6]; on the other, its text is characterised by a number of exceptions – namely, in the field of research and development, national security and national defence – that would exclude the application of the Framework Convention to some relevant fields of use of AI systems[7].

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[5] The ER underlines that "[t]he definition reflects a broad understanding of what artificial intelligence systems are, specifically as opposed to other types of simpler traditional software systems based on the rules defined solely by natural persons to automatically execute operations. It is meant to ensure legal precision and certainty, while also remaining sufficiently abstract and flexible to stay valid despite future technological developments" (para. 24).

[6] For a critical stance, see, for instance, the Parliamentary Assembly, Draft Framework Convention on Artificial Intelligence and Human Rights, Democracy and the Rule of Law, Opinion 303 (2024), 18 April 2024, para. 7 (hereinafter Opinion of the Parliamentary Assembly). The Framework Convention establishes a system whereby States Parties may determine how they intend to address the risks and impacts arising from the use of AI by private actors, through a declaration submitted to the Secretary General of the Council of Europe either at the time of signature or upon depositing the instrument of ratification, acceptance, approval, or accession (see Article 3(1)(b)). On these issues, see also *infra*, Section 3.

[7] In this sense, see, for instance, Babická and Giacomin (2024); Seatzu (2025) p. 14 ff.

Against this background, this contribution seeks to assess the potential application and relevance of the Framework Convention to a concrete phenomenon that is both emerging and rapidly evolving, namely autonomous shipping. The advent of such technologies has already raised a number of regulatory challenges (Section 2). It will be argued, in particular, that the Framework Convention, if duly interpreted, could in principle extend to certain activities carried out by autonomous ships through AI-based systems, notwithstanding the exceptions noted above (Section 3). At the same time, the analysis will demonstrate the existence of significant interpretative challenges that may hinder the Framework Convention's application and weaken its effectiveness (Section 4). Accordingly, possible solutions to address these issues will be considered (Section 5).

2. Autonomous ships, artificial intelligence, and regulatory issues

Autonomous ships are vessels capable – to a varying degree – of operating independently of human interaction[8], in some cases even without a crew on board. They have already begun to be tested and used in different parts of the world and may be deployed in multiple contexts and for various activities. They are likely to be employed, *inter alia*, in merchant shipping[9], for military

[8] This is the working definition adopted by the International Maritime Organization (IMO) of the so-called Maritime Autonomous Surface Ships (MASS) for the purposes of the regulatory scoping exercise (see Framework for the Regulatory Scoping Exercise for the Use of Maritime Autonomous Surface Ships (MASS), Doc. MSC 100/20/Add.1, Annex 2, p. 1; on the regulatory scoping exercise, see *infra* in this Section). The IMO has also introduced four categories of MASS, reflecting different levels of autonomy and corresponding management methods as well as the degree of human control: (i) ships with automated processes and decision support; (ii) remotely controlled ships with seafarers on board; (iii) remotely controlled ships without seafarers on board; and (iv) fully autonomous ships. In legal doctrine, no generally accepted definition of autonomous ships or vessels exists, and various definitions and taxonomies have been proposed, depending on aspects such as the presence of a crew on board, their design, and their degree of autonomy. For instance, Klein (2025) p. 9 uses "fully autonomous" to refer "to MAVs that have artificial intelligence and machine learning and so can operate based on programming without any human intervention, either onboard or remotely".

[9] Indeed, there are now several examples that can be cited in this regard. In addition to the already famous case of the fully-electric container ship Yara

operations[10], and for law enforcement and border surveillance purposes[11].

With regard to AI-based technology, although "traditional" ships are increasingly equipped with such systems[12], a distinctive feature characterizing at least certain categories of autonomous ships – specifically those without a crew on board and the "fully" autonomous ones – is their inherent reliance on sophisticated AI systems, such as collision-avoidance mechanisms, to ensure safe and effective navigation. This entails the capacity to make autonomous decisions in response to unforeseeable events and changing conditions at sea[13]. In other words, AI constitutes a *structural* component of these ships, and it seems reasonable to assume that most types of autonomous ships will be equipped with AI-based systems, even where they do not operate in a fully autonomous manner. Furthermore, the use of AI technology is not expected to be confined solely to situational awareness and navigational functions[14].

Birkeland, operating between the Norwegian ports of Brevik, Larvik and Porsgrunn, a similar ship was launched in China (see *China Launches its First Autonomous Container Ship Service*, in *The Maritime Executive*, 25 April 2022) and soon in South Korea (*HD Hyundai Begins Autonomous Demonstration with Larger Containership*, *ibid.*, 4 November 2024).

[10] For instance, the Blue Water Autonomy company has recently started to design autonomous ships for the U.S. Navy (*New Startup Wants to Design Unmanned Ships for U.S. Navy*, in *The Maritime Executive*, 21 April 2025).

[11] On the possibility to use autonomous ships for law enforcement purposes, see, among others, Petrig (2021); Saiful Karim and Proelss (2025).

[12] It is widely acknowledged that the relevance of AI technology is likely to increase in the near future for the shipping industry at large, *inter alia* to improve its safety and efficiency (see, for instance, Durlik, Miller, Kostecka, and Tuński, 2024).

[13] For instance, Lange (2025), p. 17 observes that "in case of loss of communication, a 'fallback mechanism' an ample level and scope of autonomy to either maintain the current position and avoid collisions or proceed to a predetermined safe anchor place are necessary to avoid maritime casualties. Irrespective of the general level of autonomy, the fallback mechanism must be fully autonomous as it operates in situations where there is no reliable communication with the [remote control centre]. Thus, operations without a crew on board necessitate autonomy". On those aspects, see widely Veitch and Alsos (2022); Lee, Lee, Jeon and Bae (2024).

[14] As is known, air drones with radars, thermal sensors and biometric technology are already in use – or soon to be used – to patrol and monitor borders (on the issue, see Klein (2021); Topak (2023); Kontak (2024), p. 623; Rinaldi and Teo (2025)). The possibility for autonomous ships to be used for border surveillance is under study (see, for instance, Fernandes *et al.* (2025)).

The emergence of autonomous ships also poses significant regulatory challenges, as it calls into question the very foundations of the law of the sea and long-standing maritime customs, including the requirement of the master's continuous presence and accountability on board, as well as the duty to render assistance to persons in distress at sea[15].

In this connection, the International Maritime Organization (IMO) is currently conducting a regulatory exercise, aimed in particular at assessing the compatibility of autonomous ships – or, according to the terminology used, of Maritime Autonomous Surface Ships (MASS) – with the relevant international legal instruments under its purview, and at providing for the appropriate changes and additions at regulatory level[16]. In fact, due to their peculiar characteristics, their deployment is likely to require – at least – some changes to the regulatory framework. The regulatory scoping and drafting exercise underway within the IMO is therefore aimed at accommodating autonomous ships within the existing regulatory framework, with a view to ultimately adopting a non-mandatory Goal-Based instrument by 2026 and a mandatory one by 2032.

In any case, the scope of the IMO's regulatory exercise remains somehow limited, as it is – tendentially – confined to the legal instruments under its purview[17]. Human rights treaties, among others, are therefore excluded. Yet one of the legal questions arising from the use of autonomous ships concerns their compatibility with human rights standards[18]. Indeed, certain activities carried out through the use of – or in connection with – AI may also have an impact on human rights[19].

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[15] On these issues, see *infra*, notes 53-54. More generally, see also Ringbom, Røsæg and Solvang (2021); Lange (2025); Klein, Guilfoyle, Saiful Karim and McLaughlin (2025).

[16] On the issue, see, for instance, Asta (2023); Stępień (2024).

[17] For instance, it remains debated whether the IMO itself has the competence to interpret UNCLOS and to assess the compatibility of MASS therewith, or whether such interpretative authority rests exclusively with the States Parties to UNCLOS (on the issue, see Asta (2023), p. 332; Stępień (2024), p. 628-629)).

[18] Those aspects were also emphasised by the Parliamentary Assembly of the CoE, albeit with regard to autonomous vehicles (see the Report adopted by the Committee on Legal Affairs and Human Rights, Doc. 15143, 22 September 2020, and the Recommendation 2187 (2020) of the Parliamentary Assembly on *Legal Aspects of "Autonomous" Vehicles*).

[19] For some examples, see *infra*, notes 25-26 and the relevant passage.

3. Some reflections on the possible applicability of the Framework Convention to activities carried out by autonomous ships

In principle, the theoretical applicability of the Framework Convention to certain activities carried out by autonomous ships does not appear particularly problematic, owing to the relatively broad definition of 'artificial intelligence system' adopted within the Framework Convention[20].

Moreover, the potential relevance of the Framework Convention is supported by the wording of Article 3, which, in defining its scope, provides that it covers activities having "the potential to interfere", *inter alia*, with human rights. The notion of "interference" appears, at first sight, sufficiently broad to encompass not only direct breaches of human rights obligations

[20] See *supra*, Section 1. Indeed, at this stage, this remains merely a hypothesis, given the persisting uncertainties surrounding both the evolving design of autonomous ships and the precise scope and interpretation of the definition of artificial intelligence as currently adopted. For example, the Explanatory Memorandum to the OECD definition clarifies that "[t]opics typically encompassed by the term 'AI' and in the definition of an AI system include categories of techniques such as machine learning and knowledge-based approaches, and application areas such as computer vision, natural language processing, speech recognition, intelligent decision support systems, intelligent robotic systems, as well as the novel application of these tools to various domains". Among the examples cited, the Explanatory Memorandum specifically includes driver-assist systems (see Explanatory Memorandum on the Updated OECD Definition of an AI System, March 2024, available at www.oecd.org, pp. 6 and 9). For further discussion on activities potentially falling within the scope of the AI system definition, see also Zaccaroni (2024), p. 14-15. Indeed, analogous definitional challenges are likely to affect the definition set forth in the EU AI Act, which, *inter alia*, appears to closely resemble that adopted in the Framework Convention (this progressive convergence has been noted, among others, by Presno Linera and Meuwese (2025), p. 10, who observe that the current definition "substantively, although with slight variations in the exact formulation, coincides with that adopted by the Framework Convention"). In this regard, the European Commission has recently issued guidelines on the definition of AI systems (see the *Commission Guidelines on the Definition of an Artificial Intelligence System Established by Regulation (EU) 2024/1689 (AI Act)*, 6 February 2025), which have already elicited critical commentary (see, for instance, see the *Comment by the Advisory Committee on the Ethics of Artificial Intelligence of the Austrian Commission for UNESCO*, 21 March 2025, available at www.unesco.at).

arising from the activity in question but also actions that may indirectly or incidentally affect the enjoyment of human rights[21].

On the other hand, as already noted, the Framework Convention contains a number of exceptions that could significantly limit its scope. A closer examination, however, suggests that these exceptions do not entirely preclude its applicability to activities conducted by autonomous ships or, more broadly, its relevance and the imposition of certain obligations upon State parties. In fact, whereas the national defence exception is rather straightforward in its formulation[22], the other exceptions are not "blanket" in nature[23], being variously qualified[24].

In this respect, the case of law enforcement activities could for instance represent an illustrative example. Some of the possible activities that States might conduct in the context of maritime law enforcement through autonomous ships and AI technology could potentially interfere with human rights. One could imagine, for instance, possible infringements of privacy and data protection rights resulting from the gathering and transmission of data concerning activities at sea, including through the use of biometric identification systems[25]. Another example could be physical or

[21] The ER confirms that the Framework Convention has a "broad scope" (para. 26).

[22] See Art. 3(4).

[23] For a different view, see Babická and Giacomin (2024).

[24] This reasoning applies also to some specific exceptions introduced by the Framework Convention alongside the "classical" ones. In particular, Article 3(3) excludes from its scope research and development activities concerning AI systems not yet made available for use, "unless testing or similar activities are undertaken in such a way that they have the potential to interfere with human rights, democracy and the rule of law". This qualification appears to imply that testing or similar activities which have the potential to interfere, *inter alia*, with human rights are not excluded from the scope of the Framework Convention (see also the ER, paras. 33-34). States Parties are therefore under a duty to assess such potential risks.

[25] As is well known, the use of real-time remote biometric identification systems – and more specifically, facial recognition systems in public spaces – remains highly controversial. The matter is addressed in the EU AI Act, which, pursuant to Article 5(1)(h), generally prohibits their use, subject, however to a number of exceptions. These exceptions permit deployment for the purpose of law enforcement only "in so far as such use is strictly necessary for one of the following objectives: (i) the targeted search for specific victims of abduction, trafficking in human beings or sexual exploitation of human beings, as well as the search for missing persons; (ii) the prevention of a specific, substantial and imminent threat to the life or physical safety of natural persons or a genuine and

material damage caused by the malfunction of a collision-avoidance algorithm, which may entail breaches of several rights, including the right to life and personal integrity[26].

These situations appear to fall, at least potentially, within the scope of the Framework Convention. Article 3(2), in delimiting the so-called national security exception, specifies that a Party is not required to apply the Convention to activities related to the protection of national security interests. However, this is "with the understanding that such activities are conducted in a manner consistent with applicable international law, including international human rights law obligations".

Besides, it is worth noting that the ER expressly states that "[a]ll regular law enforcement activities for the prevention, detection, investigation, and prosecution of crimes, including threats to public security, also remain within the scope of the Framework Convention if and insofar as the national security interests of the Parties are not at stake"[27]. In other words, the notion of "national security interest" does not appear to encompass ordinary law enforcement activities.

Accordingly, it seems *prima facie* that the law enforcement activities conducted through the use of autonomous ships must, in principle, comply with the obligations set out in the Framework Convention. In any case, as noted, activities connected with

present or genuine and foreseeable threat of a terrorist attack; (iii) the localisation or identification of a person suspected of having committed a criminal offence, for the purpose of conducting a criminal investigation or prosecution or executing a criminal penalty for offences referred to in Annex II and punishable in the Member State concerned by a custodial sentence or a detention order for a maximum period of at least four years". In those cases, real-time remote biometric identification systems shall be deployed "only to confirm the identity of the specifically targeted individual [….]" and shall take into account a number of further elements. Furthermore, "each use […] shall be subject to a prior authorisation granted by a judicial authority or an independent administrative authority whose decision is binding of the Member State in which the use is to take place […]". In this connection, see also the guidelines that the European Commission recently issued on prohibited AI practices (4 February 2025), in particular p. 90 ff. Nonetheless, critics argue that these exceptions are overly broad and risk granting law enforcement and migration authorities an excessive margin of appreciation (see Paolucci (2024); Haeck (2025)). On the topic, see, more generally, McLaughlin (2025); Molnár (2025).

[26] More broadly, on the issue, and for some examples, see Saiful Karim and Proelss (2025), p. 183 ff.

[27] See the ER, para. 32.

national security interests must be carried out in conformity with applicable international law, including obligations arising under international human rights law. According to the ER, this requirement implies that such activities must rest on an explicit legal basis, respect the essence of human rights, and constitute a necessary and proportionate measure in a democratic society, as provided for in several human rights treaties expressly cited in the ER[28].

Whereas law enforcement activities are, as seen, potentially within the scope of the Framework Convention, the situation is less straightforward with regard to activities carried out by private actors. The provisions of the Framework Convention concerning the obligations of State Parties in relation to private actors have, in fact, raised particular concerns. According to Article 3, State Parties are required to apply the Framework Convention to activities "undertaken by public authorities, or private actors acting on their behalf". By contrast, for activities carried out independently by private actors, States are only required to "address risks and impacts" arising from such activities[29]. In doing so, they enjoy a margin of appreciation: they may either apply the principles and obligations of the Framework Convention or adopt – in terms left undefined – "other appropriate measures"[30].

This differentiated approach could also prove problematic in the emerging field of autonomous shipping, since many of the projects currently underway are financed and conducted by private companies[31]. Accordingly, the risk that designs and practices not compliant with human rights requirements may become entrenched cannot be excluded.

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[28] *Ibid.*

[29] For instance, as the CoE Parliamentary Assembly observed, "[m]any AI systems are developed and deployed by private entities, and introducing a differentiated approach for the private sector creates a significant loophole" (see the Opinion of the Parliamentary Assembly, para. 7).

[30] The ER further notes that the reference to the object and purpose of the Framework Convention implies that States Parties are not only required to acknowledge those risks, but also to adopt and maintain appropriate legislative, administrative, or other measures to give effect to this requirement, including cooperation between the Parties (para. 29). Still, the Report also adds that "the obligation does not necessarily require additional legislation and Parties may make use of other appropriate measures, including administrative and voluntary measures" (*ibid.*).

[31] For some examples, see *supra*, notes 9 and 10.

Still, one may ask whether in this context the Framework Convention nonetheless also imposes more specific – and possibly additional – obligations on States Parties, even where the latter decide not to apply the Framework Convention fully to private parties. First, risk assessment must be carried out regardless of the type of measures that States choose to adopt in order to address risks and impacts arising from private activities[32]. Moreover, pursuant to Article 13, which enshrines the so-called principle of safe innovation, State Parties are under the obligation to enable, "as appropriate, the establishment of controlled environments for developing, experimenting and testing artificial intelligence systems under the supervision of [their] competent authorities".

In this respect, it may be questioned whether the provision likewise requires States, where appropriate, to enable competent authorities to set up controlled environments or frameworks that also extend – in all cases – to private actors, including those operating in the field of autonomous shipping[33]. While, as noted, States do enjoy a certain margin of appreciation in determining how to apply the Framework Convention to private entities, some passages of the ER nonetheless suggest that the abovementioned preventive approach to innovation is intended to have a generally applicable scope[34].

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[32] The modalities for conducting such risk assessment are – loosely – regulated by Article 16. For critical commentary on the dangers associated with the flexibility afforded to States Parties, see Levantino and Paolucci (2025), p. 31-32.

[33] Nevertheless, the wording of the provision leaves open the question of whether States are themselves under an obligation to directly establish controlled environments – or at least to verify their adequacy for the intended purposes – or whether it suffices for them merely to empower competent authorities to do so. The former reading arguably finds some support in a passage of the ER, which clarifies that "[i]n view of the diversity and underlying complexity of legal systems and regulatory traditions in the States which negotiated the Framework Convention, the provision leaves the specific details of the relevant arrangements up to the Parties, provided that the regimes set up under this provision comply with the requirement to 'avoid adverse impacts on human rights, democracy and the rule of law'". Furthermore, the ER notes that possible means of giving effect to this obligation may include regulatory sandboxes, special regulatory guidance, or no-action letters designed to clarify how regulators will assess the design, development, or deployment of artificial intelligence systems in novel contexts. For instance, on the specific issue of regulatory sandboxes from a comparative perspective, see Trapani (2022). As regards the context of the EU AI Act, see Rugani (2024).

[34] Apparently, the ER adopts a rather general approach and does not differentiate between the ways in which States Parties might address the role of private actors.

Moreover, such an interpretation of the Framework Convention may be regarded as consistent with the due diligence standard of conduct incumbent upon States under human rights law[35]. In scholarly literature, this standard is generally understood as requiring States to exercise their best efforts, *inter alia*, to prevent harm resulting from activities carried out by private actors, in accordance with a criterion of reasonableness[36]. More broadly, one may also ask whether the obligation to assess risks arising from

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The ER acknowledges that safe innovation constitutes "an important theme which lies at the heart of the approach of the Framework Convention: Parties should seek to promote and foster innovation in line with human rights, democracy and the rule of law. One suitable way to stimulate responsible innovation with regard to artificial intelligence is by enabling the authorities in the relevant sector of activity to set up 'controlled environments' or 'frameworks' to allow development, training, live experimentation and testing of innovations under the competent authorities' direct supervision, in particular to encourage the incorporation of quality, privacy and other human rights concerns, as well as security and safety concerns in the early stages" (para. 90). Furthermore, the ER observes "that some artificial intelligence developers, *including those with a public interest mission*, cannot proceed with their innovation unless they can be reasonably sure that it will not have harmful implications and incorporate appropriate safeguards to mitigate risks in a controlled environment" (para. 91 – emphasis added), therefore possibly implying that the provision also encompasses the activity of developers without a public interest mission. In addition, the ER further notes that "[s]uch approaches facilitate knowledge-sharing among *private entities*, regulators, and other stakeholders. These collaborative environments may foster a better understanding of artificial intelligence technologies, their implications, and potential governance approaches and provide legal certainty to innovators and support them in their compliance journey" (para. 93 – emphasis added).

[35] Even though due diligence has been variously qualified in the literature (*e.g.*, as a 'notion', a 'principle', an 'obligation', etc.), recent scholarship tends to converge on the view that it constitutes a standard of conduct (on this point, see, most recently, Lanovoy (2024), p. 1035-1036).

[36] On this point, and for further references, see, among others, Krieger and Peters (2020), p. 368 *et passim*; Koivurova and Singh (2022) para. 17 ff.; Forlati (2022), p. 532-533. Besides, under human rights law, the margin of discretion left to States in determining appropriate measures may be narrower than in other domains. As Baade (2020), p. 102 observes, this is partly due to the fact that the range of measures capable of effectively safeguarding a given right – particularly when the right is of special importance – is often limited. Although States may, in principle, choose among such measures, in certain circumstances only one option proves sufficiently effective. In those situations, this may give rise to a duty to adopt that specific measure, since the particular risks and contextual factors allow for a precise determination of what is required to ensure the protection of the right concerned. On this point, see also Krieger and Peters (2020), p. 370.

private actors' activities, as provided for by the Framework Convention, might play a role in shaping the operation of due diligence obligations, including in the field of autonomous shipping. Although the precise scope of such obligations in the context of human rights protection generally varies according to the nature and importance of the right at stake[37], legal doctrine consistently underlines that knowledge of the risk – or at least its foreseeability – is a necessary precondition for the exercise of due diligence[38]. In this respect, the aforementioned obligation stemming from the Framework Convention may narrow States' margin of appreciation, by making risk foreseeability more readily ascertainable in objective terms.

4. … And on a few problematic aspects related to it

Although, as noted, it may be argued that the Framework Convention could in theory extend to certain activities carried out by autonomous ships, its effective implementation may prove challenging. The Framework Convention presents several distinctive features, largely related to its scope of application, which may raise difficulties when applied to the domain of autonomous ships.

For instance, with regard to activities conducted in the context of law enforcement, although the ER brings such activities within the scope of the Framework Convention[39], States could nonetheless consider a given law enforcement operation as threatening national security interests and therefore falling within the purview of the exception. Moreover, the ER is not, strictly speaking, binding upon States Parties[40]. While some authors

[37] See, for instance, Baade (2020), p. 98-99.

[38] See, among others, Pisillo Mazzeschi (1992), p. 44; Ollino (2022), p. 133; Besson (2023), p. 24 *et passim*. At the same time, however, doctrine is far from uniform as to the conditions under which due diligence obligations arise. In particular, there is no consensus on how to distinguish between the circumstances triggering the emergence of a due diligence duty and the elements defining its substantive content. On this point, see, for instance, Feihle (2023), p. 1044-1045.

[39] See *supra*, note 27 and the corresponding passage.

[40] The Preamble of the ER states that "[t]he text of the explanatory report submitted to the Committee of Ministers of the Council of Europe does not constitute an instrument providing an authoritative interpretation of the text of the Framework Convention although it may facilitate the understanding of its provisions".

contend that explanatory reports to international treaties may form part of the context under Article 31(2) VCLT[41], it seems more appropriate to consider the ER to the Framework Convention – also in light of what is expressly acknowledged in the preamble of the latter[42] – as a subsidiary means of interpretation pursuant to Article 32 VCLT[43]. As is well established, the VCLT circumscribes the use of supplementary means of interpretation: they may only be employed to confirm an interpretation already deriving from the text itself, or to elucidate the meaning where an interpretation in accordance with Article 31 VCLT leaves the provision ambiguous or obscure, or leads to a result that is manifestly absurd or unreasonable. Furthermore, prevailing doctrine acknowledges that the interpreter is vested with a broad margin of appreciation in determining whether recourse to such means is warranted[44].

Therefore, should States Parties, for any of the reasons mentioned above, regard enforcement activities as falling within the national security interest exception, the formulation of that exception could prove problematic, in light of the current uncertainties surrounding the international legal framework applicable to autonomous ships. The regulatory scoping and drafting exercise currently underway within the IMO has fallen behind schedule for various reasons. Consequently, no international instrument specifically addressing the regulation of autonomous ships is presently in force[45]. Moreover, as previously noted, the scope of the IMO's regulatory initiative is subject to

[41] In particular, this would be the case where explanatory reports are drafted by governmental experts. In this respect, see Villiger (2009), p. 430 (with reference to Article 31(2)(b) VCLT); and Dörr (2018), p. 591 (apparently referring to Article 31(2)(a) VCLT).

[42] See *supra*, note 40. By contrast, the Explanatory Report to the Second Additional Protocol to the CoE Convention on Laundering, Search, Seizure and Confiscation of the Proceeds from Crime and on the Financing of Terrorism explicitly states: "[a]s an instrument made in connection with the conclusion of a treaty, within the meaning of Article 31, paragraph 2(b) of the Vienna Convention on the Law of Treaties, this declaration forms part of the 'context' of the Convention" (p. 46).

[43] In a similar sense, see also Amoroso, in this Issue. For a similar view on the relevance of explanatory reports, see also Council of Europe, Access Info Group (AIG), Draft Opinion on the Definition of "Official Documents" according to the Council of Europe Convention on Access to Official Documents, para. 11.

[44] By way of example, see Dörr (2018), p. 628.

[45] The only – partial – exception is the circular adopting the Interim Guidelines for Mass tests, MSC.1/Circ.1604.

certain limitations and does not, in any event, extend to human rights treaties.

The lack of clarity in the relevant international regulatory framework concerning autonomous ships could therefore somehow "neutralize" the saving clause inserted in the national security exception, according to which, as stated, the activities linked to national security interests must be conducted "in a manner consistent with applicable international law, including international human rights law obligations".

But even if States were to consider those enforcement activities as falling within the scope of the Framework Convention, the latter nonetheless confers a significant margin of appreciation in the adoption of relevant measures. In this regard, the Framework Convention not only provides a degree of flexibility as to the precise manner in which the obligation to "adopt or maintain measures to ensure that the activities within the lifecycle of artificial intelligence systems are consistent with obligations to protect human rights"[46] is to be fulfilled[47], but the ER further emphasizes that, when designing specific measures, States enjoy a certain discretion in reconciling the competing interests involved. As the ER explicitly notes, in this balancing exercise States may also take into account the specific characteristics of sectors such as law enforcement, migration, and border control[48].

This significant leeway granted to States Parties may jeopardise the overall degree of effectiveness in the implementation of the Framework Convention, also in light of the rather indeterminate content of the rights it purports to protect. Indeed, the Framework Convention does not set forth any specific catalogue of rights but rather refers only to the "obligations [of each State Party] to protect human rights, as enshrined in applicable international law and its domestic law"[49].

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[46] See Art. 4.

[47] The measures to be adopted shall be "graduated and differentiated, as may be necessary in view of the severity and probability of the occurrence of adverse impacts", *inter alia* on human rights (see Art. 1(2)). As the ER further observes, this approach reflects both the diversity of national legal systems and the wide array of contexts in which artificial intelligence systems may be deployed (see ER, para. 16).

[48] See ER, para. 17.

[49] See Article 4. On this point, and for some critical remarks, see Seatzu (2025), p. 17-18.

In addition to the said indeterminacy, it remains unclear whether the rights protected are confined to those enshrined in human rights treaties, or whether the Framework Convention may be construed as encompassing rights deriving from customary international law or from treaties of a different nature. By way of illustration, some authors argue that a right to be rescued at sea has emerged at the intersection of the law of the sea and international human rights law[50]. Such a right would thus appear to be grounded in customary international law or, at the very least, to transcend the strict confines of human rights treaties. In principle, the broad wording of Article 4 of the Framework Convention could allow for a wide-ranging interpretation. However, the Explanatory Report makes explicit reference only to a list of the main global and regional human rights instruments and treaties[51].

These uncertainties become all the more problematic in light of the broader context surrounding the advent of autonomous ships. There is, in fact, a tangible risk that certain States, as well as private stakeholders within the maritime sector, may attempt to leverage the specific features of autonomous vessels – including their integrated artificial intelligence systems, such as collision-avoidance technologies – with a view to *circumventing* existing obligations under international human rights law[52].

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[50] The matter has recently been discussed in light the UN Human Rights Committee's decision on the *A.S.* case and the individual opinion of Committee Member Hélène Tigroudja, adopted on 28 April 2021. In favour of the possibility to recognise such a right, at present or in perspective, see, for instance, Papachristodoulou (2022); Dimitrova (2023); but in a somewhat similar sense see also Trevisanut (2014). Conversely, in a skeptical sense, see Papastavridis (2014). For an alternative view, specifically on the possibility of construing, in addition to a duty, a right of the shipmaster to act in compliance with international law – and, consequently, to render assistance at sea – see Starita (2019) 39 ff. Besides, a somehow related question is the applicability of human rights treaties to search and rescue activities conducted in the high sea and, more broadly, to maritime law enforcement activities (on the issue, see recently, Saiful Karim and Proelss (2025) 195 ff.), an issue that has often emerged in connection with the interpretation of the boundaries of the notion of jurisdiction before human rights courts and treaty bodies (see *infra*, note 52).

[51] See ER, para. 39.

[52] As for States, this conduct could arguably be related to emerging jurisprudential trends within human rights courts and treaty bodies on the interpretation of jurisdictional thresholds in the context of search and rescue operations at sea, notwithstanding the persisting inconsistencies across the case law. As is known, the approaches to the matter are rather diverse. On the one hand, the UN Human Rights Committee (HRC), in the already mentioned *A.S.*

Such practices could be facilitated by the regulatory ambiguities that, as noted, still characterise the field of autonomous shipping. For instance, uncertainty persists as to the existence and scope of obligations that may be incumbent upon the remote operator – if any – in the framework of search and rescue (SAR) activities, as well as regarding the extent to which autonomous ships themselves may be deemed capable of effectively performing such operations[53]. This situation of indeterminacy is further

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case, has recognised the applicability of the International Covenant on Civil and Political Rights to search and rescue activities conducted in the high sea, taking an expansive stance on the interpretation (and application) of jurisdictional requirements and finding Italy responsible for having breached a number of obligations stemming from the Covenant, in light of the existence of a 'special relationship of dependency' with the victims. Yet, at the same time, the decision has also been criticised (for instance, see the dissenting opinions of Committee Members Andreas Zimmermann and Yuval Shany, Christof Heyn and Photini Pazartis), also in light of the possible – unintended – consequences that might stem from the HRC's decision. The decision risks producing the undesirable effect of encourage States Parties to the Covenant to intentionally avoid interaction with vessels in distress so as to prevent the legal inference of a 'special relationship of dependency' having been established (for a comment, see Vella de Fremeaux and Attard (2021)). On the other, in *S.S. and Others* v *Italy*, the ECtHR seems to have followed a different – more restrictive – path towards the establishment of its jurisdiction, that ultimately led it to declare the inadmissibility of the case (for a critical assessment of the case see, for instance, Moreno-Lax (2025).

[53] In fact, it remains unclear how such duties could be effectively discharged by autonomous ships, whose design features may, in certain circumstances, render them – wholly – unsuitable for search and rescue (SAR) operations (on this issue, and for broader reflections, see Asta (2021), p. 255 ff.; Mandrioli (2023a), p. 353 ff.). In this regard, a report available on the Det Norske Veritas website suggests that, during the 110th session of the IMO Maritime Safety Committee (June 2025), it was decided that autonomous ships should be capable of assisting persons in distress and therefore required to carry a plan for conducting SAR operations, even in the absence of crew on board (see *IMO Maritime Safety Committee (MSC 110)*, 30 June 2025, available at www.dnv.com). However, the official Report of the MSC Secretariat does not record any such decision. It merely notes that "[p]otential future engagement of MASS in search and rescue (SAR) operations should continue to receive careful consideration. In relation to this, no exemption should be granted to MASS from the obligation to comply with SOLAS regulation V/33 on rendering assistance to ships in distress. Any future SAR framework for MASS should be based on the SAR Convention and UNCLOS" (*Report of the Secretariat of the MSC on Its 110th session*, doc. MSC 110/21, 7 August 2025, p. 31).

Actually, a further and distinct issue arises as to whether existing international rules on the duty to render assistance at sea might impose substantive limitations on the navigation of fully autonomous vessels, particularly in scenarios where

exacerbated by the difficulties in determining jurisdiction and attributing responsibility in cases where, for instance, the flag State differs from the State in which the remote operator is located[54].

Against this backdrop, the Framework Convention risks displaying reduced effectiveness. Particular attention must therefore be paid to the manner in which the concept of "interference" with human rights will be construed and applied.

5. Looking forward

The previous assessment has demonstrated that, if duly interpreted, the Framework Convention possesses the capacity to assume a significant role in the governance of AI-based technologies across diverse domains of application. Put differently, notwithstanding the substantial derogations circumscribing its material scope, the Framework Convention nonetheless retains the potential to operate as an overarching normative framework for the protection of human rights.

At the same time, the case of autonomous ships has brought to light certain potential loopholes within the Framework Convention. To safeguard its effectiveness, additional measures may be required. One possible avenue would be the adoption of supplementary legal instruments – such as protocols – aimed at establishing a more detailed regulatory framework to govern the use of AI in different specific domains, including that of autonomous shipping[55]. The prospect of complementing the Framework Convention through additional instruments is

operational decisions are entrusted entirely to algorithm-based systems. In particular, with regard to the obligation to provide assistance, the role of the programmer of such decision-making algorithms can hardly be assimilated to that of the ship's master, as the former exercises no control over the vessel during navigation (see, in this sense, Mandrioli (2023a), p. 360 ff.). However, one may ask whether the operation of fully autonomous ships could nonetheless be made compatible with international obligations through some form of human involvement, despite the capacity of algorithmic technologies to take operational decisions autonomously. *Ex post* supervisory mechanisms could, for instance, allow for the review and possible modification of decisions made autonomously by algorithmic systems (the so-called human control on the decision-making loop). On this point, for further reflections, see Amoroso, in this Issue.

[54] On the issue, see, for instance, Solvang (2020); Mandrioli (2023b).

[55] In the same vein, and from a broader perspective, see, for instance, Chang (2024), p. 98. Along similar lines, some authors have already advocated the adoption of an additional protocol (see Nnawuchi (2024)).

expressly contemplated in its Preamble and is consistent with the very nature of the Framework Convention, as also underscored by the Parliamentary Assembly of the Council of Europe[56].

In this respect, the Conference of the Parties (CoP) could assume a pivotal role. The Framework Convention provides that the CoP shall periodically convene with a view to "considering the possible supplementation or amendment" of the Framework Convention[57]. Even in the absence of, or irrespective of, additional regulatory instruments, the CoP may nevertheless contribute to the effective implementation of the Framework Convention by advancing a tailored interpretation of its relevant provisions and key notions in the context of autonomous ships, particularly given the numerous and complex interpretative challenges arising in this domain[58]. As previously observed, the extent to which the Framework Convention will be applicable to activities conducted by autonomous ships will likely depend, *inter alia*, on how the concept of "interference" with human rights is construed[59].

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[56] As the Parliamentary Assembly observed in its opinion, the framework nature of the Framework Convention "also means that it will need to be supplemented by other binding or non-binding instruments concerning the use of AI in specific sectors or further developing certain provisions of the convention", while also expressing its readiness to contribute to their preparation (see the Opinion of the Parliamentary Assembly, para. 5). At the same time Levantino and Paolucci (2025), p. 28-29 argued that the Framework Convention does not explicitly regulate the modalities for introducing further protocols, and therefore its full potential as a 'framework instrument' might remain largely unexploited.

[57] See Article 23(2)(b). The ER further notes that the CoP "has the traditional follow-up competencies and plays a role in respect of […] the amendment of the Framework Convention, by making proposals for amendment […] and formulating its opinion on any proposal for amendment […] which is referred to it" (ER, para. 132).

[58] This aspect will likewise be of fundamental importance in resolving potential inconsistencies that may arise between the Framework Convention and the EU AI Act. For instance, a State that is both an EU Member State and a Party to the Framework Convention could deem that compliance with the standards set out in the EU AI Act is insufficient to discharge its duties under the Framework Convention (a potential area of conflict could arise in connection with the use of biometric identification systems – see *supra*, note 25). Indeed, although Article 27 of the Framework Convention obliges Parties that are also EU Member States to apply, in their mutual relations, the relevant EU rules covering matters falling within the scope of the Framework Convention, this obligation must nevertheless be fulfilled "without prejudice to the object and purpose of [the Framework Convention] and without prejudice to its full application with other Parties". On those aspects, see also Zaccaroni (2025), p. 20-21.

[59] See *supra*, Section 4 *in fine*.

The significance of the CoP's role should not be underestimated, as it may perform a broader normative function, shaping State practice and potentially fostering greater coherence across treaty regimes[60]. Although its decisions are not formally binding upon States Parties, under certain conditions they may constitute subsequent practice within the meaning of Article 31(3)(b) VCLT, or operate as supplementary means of interpretation pursuant to Article 32 VCLT[61]. Nonetheless, the extensive reliance on non-binding and largely discretionary language both in the Framework Convention and in the ER when addressing the possible CoP's role, may neither induce the Parties to attach decisive weight to the CoP's deliberations, nor necessarily compel them to take such deliberations into account[62].

More broadly, systemic coherence could also be pursued *beyond* the Council of Europe. For instance, normative complementarity may be achieved through the adoption of both binding and non-binding instruments elaborated outside the CoE framework, including at the national level. In such circumstances, in order to mitigate the risk of normative fragmentation, efforts should be directed at ensuring at least a minimum level of coordination among the relevant regulatory instruments[63].

In this connection, the phenomenon of autonomous ships could serve as a testing ground to assess the practical impact of the Framework Convention. For instance, a particularly propulsive role could be played by classification societies through the development

[60] For a comprehensive analysis of the role of the Conference of the Parties in a broader perspective, see Rioseco (2023).

[61] On the issue, see the ILC *Draft Conclusions on Subsequent Agreements and Subsequent Practice in Relation to the Interpretation of Treaties, with Commentaries*, in particular the commentary to Draft Conclusion 11 (*Yearbook of the International Law Commission*, 2018, vol. II, Part Two, p. 67 ff.).

[62] Article 23(c) of the Framework Convention, indeed, merely entrusts the CoP with the task of making "specific *recommendations*" regarding its interpretation and application. The ER goes further, affirming the "advisory role" of the CoP (para. 132) and providing that the latter may "suggest" the interpretation of legal terms contained in the Framework Convention. Moreover, the ER acknowledges that, "[a]lthough not legally binding in nature, these recommendations may be seen as a joint expression of opinion by the Parties on a given subject which *should* be taken into account in good faith by the Parties in their application of the Framework Convention" (emphasis added).

[63] The risks of inconsistencies, also in light of the so-defined "race" to regulation in the AI field and the differences in the approaches chosen, has been underlined, for instance, by Ziller (2024); Stiano (2025); Levantino and Paolucci (2025).

and adoption of detailed regulations for commercial ships employing AI-based technologies, in a manner capable of *integrating* the outcomes of the work carried out within the IMO with the principles enshrined in the Framework Convention. Such a scenario could materialise where States Parties opt to apply *in toto* the principles and provisions of the Framework Convention also to the activities of private actors[64].

Even without such an extension, the Framework Convention could still serve as a benchmark for classification societies in their activities within the IMO framework. In the interim period preceding the adoption of the envisaged goal-based instrument, classification societies could assume a constructive role in seeking to influence deliberations within the relevant IMO Committees[65], particularly with respect to the prospective adoption of functional requirements on safety and security equipment for international navigation[66]. By contributing to this process, classification societies would help increase the likelihood that these requirements not only address immediate regulatory concerns but also remain aligned with the broader objectives of the Framework Convention, thereby supporting its overall effectiveness[67].

[64] So far, only Norway has adopted such a declaration. The Parliamentary Assembly has strongly called on States parties, when ratifying the Framework Convention, to recognise its full applicability to activities of private actors (see Opinion of the Parliamentary Assembly, para. 8).

[65] In fact, this possibility seems also consistent with the Final Document adopted within the IMO's Maritime Security Committee (see Outcome of the Regulatory Scoping Exercise for the Use of Maritime Autonomous Surface Ships (MASS), Doc. MSC.1/Circ.1638, 3 June 2021 – on the point, see Asta (2023), p. 342).

[66] On the relationship between the IMO and classification societies in the regulation of autonomous shipping, see also Hasan (2025). Classification societies may also serve as key intermediaries with the maritime industry and relevant stakeholders. In this capacity, they can help ensure that the sector's specific operational needs are duly considered and incorporated.

[67] Likewise, classification societies could also contribute to the IMO's cross-cutting strategy for integrating emerging technologies, including AI, into the maritime sector, with the aim of enhancing efficiency, safety, and sustainability. At its 49th session, held in London from 10 to 14 March, the IMO's Facilitation Committee (FAL) adopted a work plan for the development of the IMO Strategy on Maritime Digitalization, which is expected to be submitted for adoption by the IMO Assembly by the end of 2027.

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