

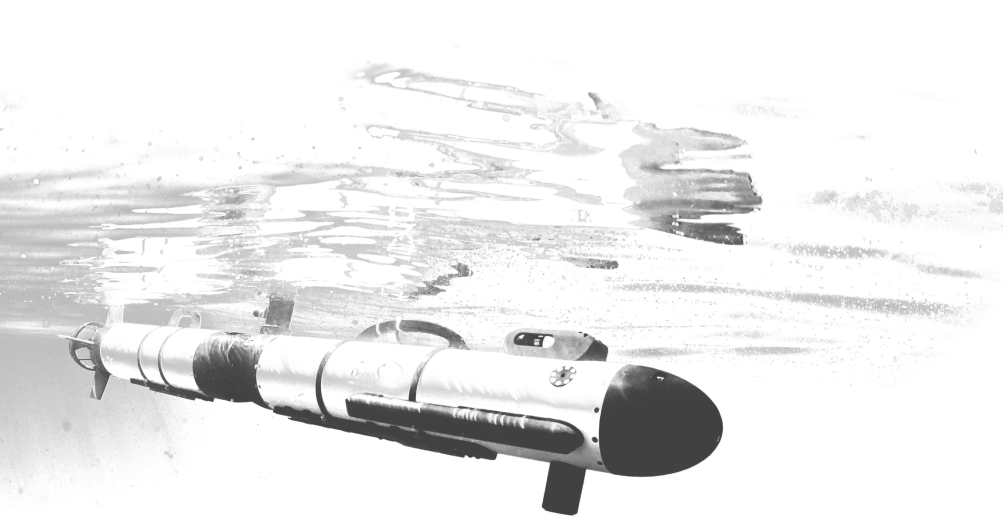


UNMANNED VESSELS & UNMANNED MARITIME VEHICLES PROSPECTS OF A LEGAL FRAMEWORK IN THE INTERNATIONAL AND THE PORTUGUESE CONTEXT

Research carried out in the scope of the **Norte 2020** project
MarInfo - Integrated Platform for Marine Data Acquisition and
Analysis, at **CIIMAR** – Interdisciplinary Centre of Marine and
Environmental Research

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References that are made to Portuguese legislation provide links to the website of '*Diário da República*' and to the website of '*Procuradoria-Geral Distrital de Lisboa*'.

EXECUTIVE SUMMARY

The purpose of this report is to analyze the legal framework applicable to the use of unmanned vessels and unmanned maritime vehicles (UMVs) both at the international and the Portuguese legal context.

The first part of this report is focused on international law. It identifies key provisions of the United Nations Convention on the Law of the Sea (UNCLOS) that are likely to apply to the operations of unmanned vessels and UMVs, and points out the main challenges that this application may raise with regard to navigational rights, to the use of UMVs in marine scientific research (MSR) and in law enforcement operations, and with regard to dispute settlement.

The second part of this report turns to national law. It provides an analysis of the main national frameworks regulating ocean-related activities, and identifies the main existing gaps that constrain the use of unmanned vessels and UMVs in areas under national sovereignty and jurisdiction, particularly regarding registration, insurance, obligations of the operator, liability in case of collision, and with regard to dispute settlement in national courts. It also suggests specific legal amendments to be introduced in the Portuguese legal system in order to facilitate the deployment and use of unmanned vessels and UMVs in the Portuguese marine environment.

At the international level, despite being regarded as the *Constitution for the Ocean*, the UNCLOS neither defines nor regulates directly the use of unmanned vessels and UMVs. Yet, the adoption of an evolutionary interpretation of the UNCLOS that is eventually supported by the State's practice is likely to promote a more flexible and up-to-date methodology in the process of interpretation that may facilitate the application of its provisions to the operations and activities of unmanned vessel and UMVs.

As a result, Article 29 of the UNCLOS shall accommodate within its scope unmanned warships. The requirements of *command of an officer* and *manning by a crew* that are imposed on warships can be interpreted as including shore-based commanders and remote crew, distantly in charge of the unmanned warship. It seems that the unmanned nature of the warships do not affect their legal regime notably the immunity that they enjoy under international law. The same rationale shall also apply to unmanned naval auxiliaries and unmanned ships operated for non-commercial purposes.

The UNCLOS legal regime designed for regular ships, notably regarding nationality, registration and flagging is also likely to apply to unmanned merchant ships, but many challenges will arise. The requirements for granting nationality to unmanned ships shall be defined by the States within their own legal systems, provided that a genuine link exists and that unmanned vessels are not registered in any other State.

Registration generates rights and obligations before the international community. Particularly regarding the diplomatic protection that the flag State shall grant to unmanned vessels, the question remains as to whether or not this protection will also be granted to distance-based masters and crew. Since they are not onboard the vessel, and do not integrate the craft as a unit, it may be worth discussing how the diplomatic protection of the flag State will be framed.

Upon registration, States are also required to exercise effective jurisdiction and control in administrative, technical and social matters. Jurisdiction over administrative and technical matters covers the flag State's competence regarding registration and release of all the documents required for a certain vessel to legally navigate. Technical regulations for unmanned vessels shall be discussed, prepared, and agreed internationally in order to be generally accepted. Flag State jurisdiction regarding social matters involving the labour conditions for the manning of ships, including training and qualification of distance-based masters and crew shall be exercised in accordance with the domestic legislation and take into account the applicable international instruments approved by the International Labour Organization (ILO) and the International Maritime Organization (IMO), which will probably be adapted to this new reality. Flag State social jurisdiction involving the assertion of criminal and civil jurisdiction over distance-based masters and the crew is likely to raise some practical challenges especially when they are not based on the flag State, but rather in a third country.

Along with the rights and obligations of the flag State, coastal States are also entitled to exercise limited criminal and civil jurisdiction over foreign ships in their territorial sea. However, in practice, it will be challenging for the authorities of the coastal State to arrest a suspect of a crime committed with an unmanned vessel. Not only may it take some time to locate the country where the suspect is based, but arresting persons in

the territory of a third State requires the adoption of several formal procedures and depends on the existence of cooperation mechanisms.

Navigational rights granted to regular vessels are likely to be extended to unmanned vessels. Accordingly, unmanned vessels are, in principle, subject to the right of innocent passage and transit passage, provided that they comply with the laws and regulations of the coastal State. The UNCLOS legal regime seems to suggest that what is relevant to assess these rights is the way and the manner in which the passage is carried out and not the type or other characteristics of the vessel. Still, coastal States are free to define rules for unmanned vessels to enter into their internal waters and ports. Navigation of unmanned vessels in the exclusive economic zone (EEZ) is subject to the principle of freedom of navigation in so far as its exercise is not incompatible with the dispositions of the UNCLOS regarding the rights of the coastal States in the EEZ. On the high seas, unmanned vessels shall exercise their freedom of navigation in good faith, with the due regard for the interest of other States and with respect to activities in the Area.

Navigational rights of regular vessels can also be used, by analogy, to support the legal regime of innocent passage of UUVs in the territorial sea of third States. As long as the UUVs have the endurance to cross the territorial sea and the technical capacity to comply with laws and regulations of the coastal State during the passage, their passage shall be permitted. The legislation of the coastal State can waive the requirement imposed by the UNCLOS and permit commercial unmanned underwater vehicles (UUVs) to navigate submerged in the territorial sea. In the EEZ and on the high seas, UUVs are subject to the freedom of the high seas. However, in the EEZ, the use of UUVs for the exploration and exploitation of natural resources, for the establishment and use of artificial islands, installations, and structures, for MSR activities, and for activities that may affect the protection and preservation of the marine environment is subject to the jurisdiction of the coastal State.

UUVs specifically used for MSR activities can be integrated into the category of equipment. In this context, they are subject to registration by the deploying State or the international organization to which they belong. Registration shall be done at the domestic level in accordance with the rules of the State regardless of any genuine link. There is also an obligation for the UUVs to adopt adequate internationally agreed warning signals to ensure safety at sea and the safety of air navigation. Deployment and use of UUVs in different maritime zones is subject to the law of the sea legal regime established for MSR.

In the territorial sea, UUVs can only be deployed and used with the express consent of, and under the conditions set forth by the coastal State. Any violation of this rule empowers the coastal State to act against the UUV and adopt enforce-

ment measures necessary to stop any illegal conduct. UMMVs launched from ships crossing the territorial sea of third States in innocent passage for MSR purposes renders the passage non-innocent.

Without prejudice to the case that the UNCLOS provides for the presumed or implied consent of the coastal State, in the EEZ and on the continental shelf, UMMVs can only be deployed and used with the consent of the coastal State. This consent shall be granted *in normal circumstances* for MSR projects carried out exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of mankind. Consent of the coastal State can be legally refused when UMMVs i) are used for the exploration and exploitation of natural resources; ii) are involved in some kind of drilling into the continental shelf, in the use of explosives or in the introduction of harmful substances into the marine environment; iii) are engaged in the construction, operation or use of artificial islands, installations, and structures; iv) are used by States that have outstanding obligations to the coastal States from a prior research project. The use of UMMVs for resources-oriented research in the extended continental shelf where the coastal State may, at any time, designate as areas in which exploitation or exploratory operations will occur within a reasonable period of time, can also be legally refused by the coastal State.

On the high seas, the deployment and use of UMMVs is free. In the Area, the deployment and use of UMMVs exclusively for peaceful purposes and for the benefit of mankind as a whole is open to all States and to competent international organizations. This includes the use of UMMVs for MSR projects over living resources, such as fisheries and bioprospecting. Conversely, the use of UMMVs for activities regarding exploration and exploitation of mineral resources is not free, since it is a matter under the mandate of the International Seabed Authority (ISA).

The use of State-owned UMMVs in law enforcement operations, such as in the right of hot pursuit may impose new interpretations of the requirements imposed by the UNCLOS. In this sense, UMMVs shall be considered as an appropriate means to be used by the States to determine the position of the offending ship, to give the visual or the auditory signal to stop, as well as to ensure the continuation of the pursuit. In tandem, under the doctrine of constructive presence, offences committed in the territorial sea of third States by private UMMVs shall also legitimate the hot pursuit of a mother ship hovering outside the territorial sea, provided that both act as a team.

Disputes arising from the deployment and use of unmanned vessels and UMMVs, notably those regarding navigational rights shall be subject to the regime of the settlement of disputes set forth in Part XV of the UNCLOS, including the compulsory mechanism. Disputes involving unmanned warships and unmanned vessels used for non-commercial purposes can be exempted from the compulsory mechanism upon

declaration of the State. Disputes regarding the use of UUVs in MSR activities shall be subject to the compulsory mechanism, unless the dispute relates to the refusal of the consent by the coastal State to the use of UUVs in applied research, when UUVs are going to be used in projects involving drilling into the continental shelf, in the use of explosives or the introduction of harmful substances into the marine environment, when UUVs are engaged in the construction, operation or use of artificial islands, installations, and structures, or when they are used by States that have outstanding obligations to the coastal States from a prior research project.

Data and information collected by UUVs may be presented by the States as evidence before international courts and tribunals, provided that States comply with the formal procedures set forth in the tribunal's Statute and the rules of procedures. Evidence collected by UUVs is submitted as documentary evidence, which has traditionally been understood in a broad way as to include not only texts of treaties, national laws and regulations, diplomatic information and correspondence, national jurisprudence, written opinions, declarations, and commentaries, but also to include maps, charts, photographs, and video presentations.

At the national level, the legal frameworks that regulate ocean-related activities, which are likely to apply to the operations of unmanned vessels and UUVs in areas under Portuguese sovereignty and jurisdiction shall have to consider the autonomy that the Portuguese Constitution gives to the Autonomous Regions of Azores and Madeira, mainly in the areas of fisheries, infrastructure, transports and communications, mining, research and technological innovation.

Overall, at the domestic level, ships and vessels are defined in different legal frameworks, which have in common the fact that they do not require ships and vessels to be manned. Yet, unmanned vessels shall comply with the existing legislation to operate legally, which may be a challenge in various respects, since the domestic frameworks were prepared assuming that ships and vessels are manned.

The typology of vessels under the Portuguese legal framework mainly integrates State vessels, merchant vessels, and recreational vessels. State vessels are those operated by the Portuguese Navy and by the security and police forces. National law does not provide detailed rules applicable to State vessels. Future regulations will have to clarify the authority that distance-based commanders will exercise over unmanned State vessels. This is also relevant because the entrance of foreign unmanned State vessels in waters under Portuguese sovereignty and jurisdiction still requires the foreign State vessel to be under the command and under the authority of the armed forces.

Unmanned merchant vessels flying the Portuguese flag, namely fishing vessels, tugboats, and vessels used for transportation of people and goods are subject to reg-

istration in the conventional registry (BMAR) or in the Madeira's International Shipping Registry. Portuguese State vessels owned by the Navy, by National Maritime Authority, by the police forces and by the civil protection services as well as and small vessels on board, lifeboats, small auxiliary fishing vessels, small boats to be used on the beach without engine or mainsail, (such as charutos boats), inflatable boats, and pedal boats to be used up to 300 meters from the lower-water line along the coast, are exempt from registration. These exceptions are likely to include small UMs.

In theory, both BMAR and the Madeira's International Shipping Registry are likely to accommodate the registration of unmanned vessels, since the definition of 'ship' provided is very broad and does not impose the requirement of manning. In practice, however, both registrations shall be amended mainly to include and determine the information that needs to be provided for the registration of unmanned vessels, such as the technology employed for distance navigation and the information regarding the activation of safety procedures in case of emergency, among others. The legal markings required by Portuguese law to identify vessels can be applicable to unmanned vessels, but it is expected that international standards will be adopted in order to facilitate the identification of unmanned vessels in the marine environment.

Rules for the maritime labour industry regarding unmanned vessels will probably be discussed at the international level as well. Yet, at the national level, new legislation needs to be discussed in order to regulate seafarers providing shore-based services. This legislation will have to consider several factors, among others, such as i) the level of the autonomy of the vessel and its capacity to take decisions or merely to be remotely controlled; ii) the duties and the obligations of the master, crew, and operators, which will certainly depend on the type of vehicles being remotely controlled; iii) the type of technology involved to enable distance-based masters, crew, and operators to control the unmanned vessel; iv) the qualifications and training of the distance-based masters, crew, and operators of the vessel; v) the responsibilities of the distance-based master, crew, and operators; and vi) occupational safety and health-related issues. It is also important to regulate the way unmanned vessels will be able to maintain the documentation on board and to provide it to the authorities when requested, although this issue, due to its relevance for navigation, will certainly be subject to international discussions.

Liability for damages caused by collision involving unmanned vessels in waters under Portuguese sovereignty and jurisdiction is subject to different legal regimes. On the one hand, collision involving unmanned vessels flagged by States Party to the 1910 Brussels Collision Convention may eventually be subject to the aforementioned Convention and its complementary conventions on civil and criminal jurisdiction. On the other hand, liability in case of collision between Portuguese flagged unmanned

vessels, even when they do occur on the high seas, is regulated in accordance with the rules established mainly by the Commercial Code, the Civil Code (CC), and by other complementary legislation. In principle, this legal regime applies to unmanned vessels, but special attention shall be given, when assessing the division of liability between the shipowner and the distance-based master when the latter has acted with fault. The shipowner is liable to pay compensation to third parties affected by collision, but the right to be reimbursed only exists if the requirements of Article 500 of the CC are met, especially when an unlawful conduct is carried out by the unmanned vessel. Within this context, there is no reason to exclude the application of the duty of care and good seamanship to distance-based masters, crew, and operators but guidelines elaborating these duties and addressing the responsibilities of distance-based masters and crew shall be in place. It shall be also discussed whether or not the use of unmanned vessels in the marine environment shall be considered a dangerous activity within the scope of Article 493(2) of the CC.

The provisions of the Commercial Code regarding maritime insurance will also apply to unmanned vessels. Yet, the perils listed in the Commercial Code shall have to be amended, so that specific perils related to the operation of unmanned vessels are covered by law. This includes, for instance, technological perils, technical and mechanical malfunctions that require human intervention, electric fires, and specific collision perils. Maritime insurances do not cover damages caused by the fault of the master known as *barataria*. This is a very important aspect to pay attention to in case of unmanned vessels. Depending on the autonomy that unmanned vessels will have, it may be problematic to define the border between an error that shall be beard by the programmer, the master or by the technology itself. In order to avoid situations of damage that are not covered by the insurance, it is suggested that a mandatory strict civil liability insurance regime shall be created.

Like unmanned vessels, the use of UUVs is not regulated within the Portuguese legal framework. However, their use in waters under national sovereignty and jurisdiction falls under the legal regime applicable to the activity for which they are being used.

The legal framework that regulates UUVs employed in MSR projects is mainly dependent on the purpose of the project and on whether the MSR project requires the use of a small area of the marine environment that can be shared along with other activities or whether it demands the exclusive use of an area of the marine environment.

Small pure MSR projects carried out in waters under Portuguese sovereignty or jurisdiction that do not require an exclusive use of a certain area of the marine environment only require an authorization given by the Ministry of the Sea or by the Ministry of Foreign Affairs in case the requirement is lodged by foreign entities. The research document shall have to mention the use of any UUV as a research method, as well as indicate the expected dates of the removal of all UUVs from the marine environment, even those that are sunken or stranded.

Pure MSR projects that requires the exclusive use of a certain area of the marine environment will have to obtain, in addition, a title for the private use of the national maritime space. Along with the information regarding UUVs that shall be mentioned in the research document, applicants shall have to specifically indicate the signaling and the safety standards to be adopted with regard to UUVs, to mention any land-based infrastructures aimed at supporting UUVs, and to include, in the contractual liability insurance, a clause to cover damages caused by UUVs. As long as the UUVs comply with the national laws and regulations in force, particularly those regarding protection and preservation of the marine environment and do not interfere with other legitimate uses of the sea, UUVs shall be considered as an appropriate method of research and their use shall not, in principle, be refused.

MSR projects carried out in the territorial sea, in the EEZ, and on the continental shelf up to 200 nautical miles adjacent to the Autonomous Regions of Azores and Madeira shall consider the competences of the Autonomous Regions in this regard.

Applied MSR projects are subject to specific legislation. In the case of fisheries, the law does not provide much detail regarding the information to be submitted. In the petroleum and in the geological sectors, national legislation does not require information regarding the equipment used. However, it does require that the applicant submit information on the technical means available as well as other elements that are relevant for the assessment of the project. Therefore, it is recommended that the use of UUVs is mentioned in the research project document.

No registration or insurance is imposed as a requirement for UUVs to be used in MSR projects or in any other activity, contrary to what happens with unmanned aerial vehicles that shall be registered and subject to mandatory civil liability insurance, regardless of the activity they perform. In the case of UUVs, their use in the marine environment for pure MSR projects is free provided that they are considered an appropriate method of research.

Entities operating UUVs in the context of MSR projects are subject to several obligations, such as the obligation of information regarding their use, the obligation to adopt all the necessary measures to ensure the good environmental status of the marine environment, the obligation to observe signaling measures and safety norms to ensure that UUVs navigate safely, and the obligation of removal from the marine environment even if they are sunken or stranded.

In addition, the entity responsible for the MSR project shall also ensure that rules regarding personal data protection are observed. However, in practice, persons are not likely to be the subject of a MSR project and, even if personal data is captured, the exception that does not require identification and excludes the obligation to maintain the information in order to identify the data subject, is likely applicable.

The entity that is responsible for the MSR project is also liable for damages caused by UMVs under the liability regime of Article 500 of the CC, provided that all of the requirements are fulfilled. Yet, in the future, it might be relevant to discuss the creation of a mandatory strict liability regime for UMVs, as it happens in case of damages caused by land vehicles or by unmanned aerial vehicles.

In terms of mandatory insurance, UMVs would only be subject to insurance if the activity where they are being used is subject to mandatory insurance. If not, UMVs, as such, are free to operate in waters under Portuguese sovereignty and jurisdiction without being covered by insurance. This contrasts with the legal regime of unmanned aerial vehicles that imposes a mandatory insurance scheme for those with a maximum operational mass exceeding 900 grams, regardless of the activities they are involved with.

In principle, it seems that the Commercial Code provisions regarding collision between vessels do not apply when UMVs are involved. Different features of UMVs, notably in terms of size and endurance may suffice to defend the application of another liability regime. This solution is not free from discussions, especially regarding the suitability of UMVs to cause damage due to their nature, structure or quality and regarding the duty of vigilance that needs to be assigned to the operator.

Disputes arising from the deployment and use of unmanned vessels and UMVs in waters under Portuguese sovereignty and jurisdiction may be brought before different types of national courts, ultimately depending on the concrete terms of the dispute and the way the case is presented by the plaintiff.

Evidence that is collected by UMVs can be submitted before national courts in the category of documentary evidence. When such evidence includes videos or sounds, the tribunal shall be provided with the technical means for the video and sound to be reproduced. In civil cases, videos or sound recordings presented from one party, shall be contested by the other party, otherwise they constitute proof of the facts they represent. When the evidence is contested, it can still be considered by the judge under the umbrella of judicial presumptions. In criminal cases, documentary evidence collected by UMVs, including mechanical reproductions, are likely to be accepted even when captured in private places without authorization based on the argument that they are used in the public interest. However, this solution is not free from controversy. When it comes to sound recorded by UMVs, the legal regime established on wiretapping applies. As a result, it can only be used for certain types of crimes and within certain conditions set forth in the law. Documentary evidence submitted is assessed by the judge in accordance with his or her experience and conviction that shall be clearly and comprehensively demonstrated in the award.

A deep and a comprehensive national legal regime that regulates unmanned vessels and UUVs requires the revision of several laws and regulations. This report identifies such laws and regulations and provides suggestions to amend specific provisions, notably regarding crewing, liability, insurance and MSR, in order to promote the use of unmanned vessels and UUVs in the Portuguese maritime system.

SUMÁRIO EXECUTIVO

O presente relatório tem como objetivo analisar o regime jurídico que é aplicável ao uso de navios não tripulados e de veículos marinhos não tripulados (UMVs) tanto ao nível internacional como no âmbito do ordenamento jurídico Português.

A primeira parte deste relatório está direcionada para o direito internacional, identificado as principais disposições da Convenção das Nações Unidas sobre o Direito do Mar (CNUDM) que provavelmente se aplicarão às operações dos navios não tripulados e dos UMVs, apontando os principais desafios que esta aplicação poderá desencadear em relação aos direitos de navegação, ao uso de UMVs para atividades de investigação científica marinha (ICM) e de policiamento, bem como no que se refere à resolução de litígios.

A segunda parte do relatório diz já respeito ao direito nacional e traduz-se numa análise dos principais instrumentos jurídicos nacionais que regulam as atividades desenvolvidas no mar, identificando igualmente as principais lacunas no que se refere ao registo, ao seguro, às obrigações do operador, à responsabilidade em caso de abalroamento e em relação à resolução de litígios nos tribunais nacionais, que restringem o uso de navios não tripulados e de UMVs em áreas sob soberania e jurisdição nacional. Para além disso, são ainda feitas sugestões sobre alterações legislativas a serem introduzidas de forma a facilitar-se o uso de navios não tripulados e UMVs no ambiente marinho nacional.

No âmbito internacional e apesar de ser conhecida como a '*Constituição dos Oceanos*', a CNUDM não define nem regula diretamente o uso de navios não tripulados e UMVs. No entanto, a adoção de uma interpretação evolutiva da CNUDM apoiada pela prática dos Estados poderá promover a adoção de uma metodologia mais flexível e atualista que facilitará a aplicação das suas normas às operações dos navios não tripulados e dos UMVs.

Desta forma, o artigo 29.º da CNUDM terá amplitude para acomodar no seu âmbito navios de guerra não tripulados, uma vez que o requisito de estar *‘sob comando de um oficial’* e de *‘tripulação’* que lhe é imposto, poderá ser interpretado no sentido de incluir os comandantes e a tripulação remota que, à distância, serão responsáveis pelo navio não tripulado de guerra. Parece que a natureza não tripulada de um navio de guerra não afeta o seu regime jurídico, nomeadamente a imunidade que lhe cabe de acordo com o direito internacional. O mesmo raciocínio deve estender-se às embarcações auxiliares e aos navios não tripulados usados para fins não comerciais.

O regime jurídico da CNUDM previsto para os navios convencionais, nomeadamente no que se refere à nacionalidade, ao registo e à atribuição de bandeira será, da mesma forma, muito provavelmente de aplicável aos navios comerciais não tripulados, pese embora diversos desafios sejam de esperar a este respeito.

Os requisitos de atribuição de nacionalidade a navios não tripulados devem ser definidos pelos Estados no âmbito do seu direito interno desde que com ele exista um vínculo substancial e o navio não tripulado não se encontre registado noutro Estado.

Uma vez efetuado o registo, geram-se diversas obrigações perante a comunidade internacional, destacando-se, particularmente a proteção diplomática que o Estado de bandeira deve garantir ao navio não tripulado. Não se encontrando, todavia, o capitão e a tripulação remota a bordo do navio e não fazendo parte do mesmo como um todo, restará saber como se processará a proteção diplomática pelo Estado de bandeira no caso de navios não tripulados.

Com o registo, os Estados ficam ainda obrigados a exercer, de modo efetivo, a sua jurisdição e controlo em questões administrativas, técnicas e sociais. A jurisdição do Estado de bandeira em questões administrativas e técnicas diz respeito à competência do Estado relativamente ao registo e à emissão de todos os documentos necessários para que o navio possa navegar legalmente. A regulamentação técnica aplicável aos navios não tripulados deve ser discutida, preparada e acordada internacionalmente de forma a ser geralmente aceite. A jurisdição do Estado de bandeira em relação a questões sociais que digam respeito às condições de trabalho do capitão e da tripulação remota, nomeadamente em termos de formação e qualificação profissional, deve ser exercida de acordo com a sua legislação interna considerando os instrumentos jurídicos internacionais aprovados pela Organização Internacional do Trabalho e pela Organização Marítima Internacional que muito provavelmente, terão de ser adaptados a esta nova realidade. A jurisdição social do Estado de bandeira que envolva o exercício de jurisdição criminal e civil sobre o capitão e a tripulação remota é suscetível de suscitar alguns desafios práticos, especialmente quando os mesmos operem a partir de um terceiro país que não o Estado de bandeira.

A par dos direitos e das obrigações do Estado de bandeira, os Estados costeiros têm igualmente legitimidade para exercer, embora de forma limitada, jurisdição criminal e civil

sobre os navios estrangeiros que se encontrem no seu mar territorial. Todavia, em termos práticos, constituirá um desafio para as autoridades do Estado costeiro deter eventuais suspeitos pela prática de um crime cometido com um navio não tripulado, não só porque levará tempo a localizar o país onde o mesmo se encontra, mas também porque a detenção de suspeitos em países terceiros obedece a formalidades próprias e depende de mecanismos de cooperação com tal Estado.

Os direitos de navegação atribuídos aos navios convencionais aplicar-se-ão com grande probabilidade aos navios não tripulados. Desde que observem e cumpram as leis e os regulamentos em vigor do Estado costeiro, os navios não tripulados gozarão, em princípio, do direito de passagem inofensiva e do direito de passagem em trânsito. Do regime legal constante da CNUDM parece decorrer a ideia que o que releva para avaliar este direito é a forma e a maneira como a passagem é feita e não propriamente o tipo e as características do navio em passagem. Ainda assim, os Estados costeiros são livres de definirem as regras para a entrada de navios não tripulados nas suas águas interiores e nos portos. Na zona económica exclusiva (ZEE), a navegação de navios não tripulados está sujeita ao princípio da liberdade de navegação, na medida em que o seu exercício não seja incompatível com as disposições da CNUDM relativas aos direitos do Estado costeiro na ZEE. No alto mar, os navios não tripulados devem exercer a sua liberdade de navegação de boa fé, tendo em devida conta os interesses de outros Estados e com respeito pelas atividades desenvolvidas na Área.

No que aos UMVs diz respeito, a atribuição do direito de passagem inofensiva pelo mar territorial de Estados terceiros, pode ser analogicamente defendida com base nos direitos de navegação dos navios convencionais. A passagem dos UMVs deve ser permitida desde que os mesmos tenham *endurance* para atravessar o mar territorial e disponham de capacidade técnica para cumprir com as leis e com os regulamentos do Estado costeiro. A legislação do Estado costeiro poderá ainda dispensar o requisito imposto pela CNUDM e permitir a navegação em profundidade de UMVs submersíveis. Na ZEE e no alto mar, os UMVs estão sujeitos à liberdade do alto mar. No entanto, na ZEE, a sua utilização para a exploração e aproveitamento de recursos naturais, para a colocação e utilização de ilhas artificiais, instalações e estruturas, para atividades de ICM e para atividades que possam afetar a proteção e a preservação do meio marinho está condicionado pela jurisdição exercida pelo Estado costeiro.

Quando os UMVs sejam especificamente usados para atividades de ICM podem ser integrados na categoria de equipamentos. Neste contexto, devem ser objeto de registo por parte do Estado ou da organização internacional a quem pertencem. O registo é feito ao nível interno de cada Estado de acordo com a sua legislação nacional e sem necessidade de existência de um vínculo substancial com o equipamento. A esta, acresce ainda a obrigação de os UMVs adotarem sinais de aviso internacionalmente acordados para garantir a segurança no mar e a segurança da navegação aérea, devendo a sua utilização nas diferentes zonas marítimas obedecer ao disposto no direito do mar quanto ao regime jurídico da ICM.

Desta forma, a presença de UMs no mar territorial depende do consentimento expresso e das condições definidas pelo Estado costeiro, sem prejuízo da possibilidade de este lançar mão e adotar as medidas necessárias para reprimir e fazer cessar a conduta lesiva. Os UMs empregues em ICM que sejam lançados à navegação no mar territorial de Estados terceiros por navio que se encontre em passagem, transforma tal passagem em passagem não inofensiva.

Sem prejuízo dos casos em que a CNUDM prevê a existência de consentimento presumido ou tácito por parte do Estado costeiro, na ZEE e na plataforma continental, os UMs só podem ser utilizados com o seu consentimento. Este consentimento deve ser dado '*em circunstâncias normais*' para os projetos de ICM que sejam desenvolvidos exclusivamente com fins pacíficos e com o propósito de aumentar o conhecimento científico do meio marinho em benefício de toda a humanidade. O consentimento do Estado costeiro apenas pode ser recusado em quatro circunstâncias: quando os UMs *i)* sejam usados para a exploração e aproveitamento de recursos naturais; *ii)* estejam envolvidos em perfurações na plataforma continental, na utilização de explosivos ou na introdução de substâncias nocivas no meio marinho; *iii)* sejam usados na construção, funcionamento ou utilização de ilhas artificiais, instalações e estruturas; e *iv)* sejam usados por Estados que se encontrem em incumprimento relativamente a projetos anteriores. O uso de UMs pode também ser recusado nos casos em que estes sejam utilizados para projetos de ICM aplicada levados a cabo em áreas da plataforma continental estendida que o Estado costeiro venha a designar, em qualquer momento, como áreas nas quais se espera que se venha a realizar, num prazo razoável, atividades de exploração e aproveitamento de recursos.

No alto mar, o uso de UMs é livre. Na Área, por sua vez, os UMs podem ser lançados por todos os Estados e pelas organizações internacionais competentes, exclusivamente com fins pacíficos e em benefício da humanidade em geral, aqui se compreendendo a utilização de UMs para projetos de ICM que incidam sobre recursos vivos, nomeadamente sobre recursos pesqueiros ou para bioprospeção. O envolvimento de UMs em atividades de exploração e aproveitamento de recursos minerais não será já, porém, livre, pois trata-se de uma matéria que cabe no âmbito do mandato da Autoridade Internacional dos Fundos Marinhos.

A utilização pelo Estado de UMs por si detidos em atividades de policiamento, como poderá acontecer no exercício do direito de perseguição exigirá a adoção de uma nova interpretação quanto aos requisitos exigidos pela CNUDM. Neste sentido, os UMs devem ser considerados como um meio apropriado ao serviço dos Estados para a determinação da localização do navio infrator, para a emanação da ordem visual ou sonora à sua imobilização, bem como para assegurar a continuidade da perseguição. Aplicando-se, neste contexto, a doutrina da presença construtiva, os ilícitos cometidos no mar territorial de Estados terceiros por UMs que sejam detidos por entidades privadas, podem também legitimar o exercício do direito de perseguição do navio mãe que se encontre ao largo do mar territorial e que com este atue em conluio.

As controvérsias que possam surgir na sequência da utilização de navios não tripulados e UUVs, nomeadamente quanto ao exercício dos direitos de navegação, devem ser submetidas ao disposto na Parte XV da CNUDM referente à resolução de litígios, inclusive aos seus procedimentos compulsórios. No entanto, os Estados podem, mediante declaração, excluir destes mecanismos compulsórios de resolução de litígios, as disputas que digam respeito a navios não tripulados de guerra e a navios não tripulados usados para fins não comerciais. As controvérsias relacionadas com os UUVs empregues em atividades de ICM estão sujeitas aos procedimentos compulsórios, a não ser que estejam relacionadas com a utilização de UUVs em projetos de ICM aplicada que envolvam o uso de UUVs em atividades de perfuração na plataforma continental, na utilização de explosivos ou na introdução de substâncias nocivas no meio marinho; que digam respeito à utilização de UUVs na construção, funcionamento ou utilização de ilhas artificiais, instalações e estruturas; ou relacionadas com o uso de UUVs por Estados que se encontrem em incumprimento relativamente a projetos anteriores.

Os dados e informações recolhidos por UUVs podem ser submetidos como meio de prova no caso de disputas que corram termos em tribunais internacionais. Para tal, devem ser observados os procedimentos formais impostos pelo Estatuto do tribunal em questão e pelas regras procedimentais aplicáveis à prova documental, que é amplamente concebida de forma a incluir não só os textos de tratados, legislação nacional, informação diplomática, correspondência, jurisprudência nacional, pareceres e declarações, mas também mapas, gráficos, fotografias e vídeos.

Ao nível do ordenamento jurídico nacional, a legislação reguladora das atividades desenvolvidas no mar e que provavelmente se aplicará às operações de navios não tripulados e de UUVs em áreas sob soberania e jurisdição Portuguesa terá necessariamente de atender à autonomia que a Constituição Portuguesa garante às Regiões Autónomas dos Açores e da Madeira, particularmente no que se refere ao nível da pesca, infraestruturas, transportes, comunicação, mineração, investigação e inovação tecnológica.

Em geral, existem vários instrumentos jurídicos nacionais que apresentam diferentes definições de navio e embarcação, sem nunca imporem, no entanto, a obrigatoriedade de os mesmos serem tripulados. Ainda assim, vários desafios se avizinham ao cumprimento por parte dos navios não tripulados da atual legislação em vigor, porque embora não o exija especificamente, foi a mesma preparada no pressuposto que os navios são, por regra, tripulados.

A tipologia de navios existente no ordenamento jurídico nacional integra sobretudo, os navios do Estado, os navios da marinha mercante e as embarcações de recreio. Os navios do Estado são aqueles operados pela Marinha Portuguesa e pelas várias forças de segurança. A nossa legislação não oferece grande detalhe sobre as regras aplicáveis a navios do Estado. Terá a futura legislação a aprovar que clarificar a autoridade que os comandantes remotos terão de exercer sobre os navios não tripulados do Estado, questão igualmente relevante

para a entrada de navios não tripulados estrangeiros em águas sob soberania e jurisdição nacional, visto o atual regime em vigor exigir que os mesmos estejam sob comando e autoridade das forças armadas do Estado.

Os navios da marinha mercante que arvoem a bandeira Portuguesa, nomeadamente os navios de pesca, rebocadores e aqueles usados para o transporte de pessoas e bens podem ser registados no registo convencional (BMAR) ou no Registo Internacional de Navios da Madeira. Estão isentos deste registo os navios da Marinha, da Autoridade Marítima Nacional e das demais forças de segurança, bem como as pequenas embarcações miúdas existentes a bordo, mesmo que sejam salva-vidas, as pequenas embarcações auxiliares de pesca e as pequenas embarcações de praia sem motor nem vela, como botes, charutos, barcos pneumáticos e gaivotas de pedais, a serem usados até 300 m da linha de baixa-mar. Poderá, portanto, equacionar-se a aplicação desta isenção a pequenos UMs.

Uma vez que as definições de navio são bastante amplas e não impõem a obrigatoriedade de existência de tripulação, tanto o BMAR como o Registo Internacional de Navios da Madeira poderão acomodar, em teoria, o registo de navios não tripulados. No entanto, na prática, ambos os registos terão de ser alterados no sentido de passarem a incluir determinada informação que terá de ser fornecida para o registo, nomeadamente quanto à tecnologia empregue para a navegação à distância e informação relativa à ativação dos meios de salvamento em caso de emergência, entre outras. As marcas de identificação exigidas pela legislação nacional serão aplicáveis aos navios não tripulados, no entanto, é bastante provável que sejam adotados padrões internacionais específicos sobre esta matéria de forma a facilitar a identificação dos veículos não tripulados no ambiente marinho.

Da mesma forma, as regras aplicáveis ao trabalho marítimo serão discutidas ao nível internacional, sem prejuízo de, no ordenamento nacional, ser necessária a discussão de nova legislação que regule a atividade dos marítimos que trabalhem remotamente. A nova legislação terá de considerar diversos fatores, entre outros, *i)* o nível de autonomia do navio e a sua capacidade de tomar decisões ou de apenas ser tripulado remotamente; *ii)* os deveres e as obrigações do capitão, da tripulação e dos operadores, o que certamente, dependerá do tipo de veículo remotamente tripulado; *iii)* o tipo de tecnologia usada que permita o controlo remoto por parte do capitão, da tripulação e dos operadores; *iv)* a qualificação e formação do capitão, da tripulação e dos operadores remotos; *v)* a responsabilidade do capitão, da tripulação e dos operadores remotos; e *vi)* questões de saúde e segurança no trabalho. Será ainda determinante regulamentar-se a forma através da qual os navios não tripulados serão capazes de manter a sua documentação a bordo e proceder à sua apresentação sempre que solicitado perante as autoridades, pese embora devido à sua importância para a navegação, acreditamos que esta questão deve ser sujeita a discussão internacional.

A responsabilidade por danos decorrentes de abalroamento em águas sob soberania e jurisdição Portuguesa que envolva navios não tripulados está sujeita a diferentes regimes

legais. Por um lado, o abalroamento que ocorra entre navios não tripulados que arvorem a bandeira de Estados parte da Convenção de Bruxelas de 1910 sobre Abalroação, está sujeita ao regime jurídico desta convenção e das suas convenções complementares em matéria de jurisdição civil e criminal. Por outro lado, a responsabilidade em caso de abalroamento entre navios não tripulados de bandeira Portuguesa, mesmo que ocorra em alto mar, é já regulada de acordo com as regras constantes no Código Comercial, no Código Civil e em legislação complementar. Em princípio, este regime legal será aplicável aos navios não tripulados, embora seja necessário dar-se especial atenção à repartição de responsabilidade entre o dono do navio e o capitão remoto, quando este tenha agido com culpa. O dono do navio será responsável pelo pagamento de indemnização a terceiros afetados pelo abalroamento tendo direito de regresso no caso de os requisitos do artigo 500.º do Código Civil se verificarem, nomeadamente no caso de haver a prática de uma conduta ilegal por parte do navio não tripulado. Neste contexto, parece que não existe motivo para se excluir a aplicação ao capitão, tripulação e operadores remotos, do dever de cuidado e de observância dos usos e costumes marítimos, muito embora seja necessário proceder ao desenvolvimento de normas orientadoras aplicáveis a tais entidades. Para efeitos de responsabilidade deverá, ainda, ser discutido se o uso de navios não tripulados no ambiente marinho poderá ou não ser considerado uma atividade perigosa nos termos previstos no n.º 2 do artigo 493.º do Código Civil.

As normas do Código Comercial relativas ao seguro marítimo serão aplicáveis aos navios não tripulados. No entanto, os riscos previstos em tal diploma terão de ser alterados de forma a nele se incluírem e a serem cobertos por lei certos riscos relacionados com a utilização de navios não tripulados. Aqui se incluem, por exemplo, riscos tecnológicos, problemas técnicos e mecânicos que exigem intervenção humana, incêndios elétricos, e riscos específicos de abalroamento. O seguro marítimo não cobre os danos causados por culpa do capitão, tradicionalmente enquadrados no conceito de barataria, o que constitui um aspeto de grande relevo a considerar no caso dos navios não tripulados. Com efeito, dependendo da autonomia, poderá vir a ser problemático definir-se a fronteira entre o erro que deve ser assumido pelo programador, pelo capitão ou pela própria tecnologia. De forma a evitar-se situações de danos não cobertos pela seguradora, sugere-se que seja instituído como obrigatório por lei, um seguro de responsabilidade civil objetiva.

Tal como acontece nos navios não tripulados, o uso de UUVs não é regulado no âmbito do ordenamento jurídico Português. Todavia, a sua utilização em águas sob soberania e jurisdição nacional caberá no âmbito do regime jurídico da atividade na qual os mesmos sejam empregues.

O regime jurídico aplicável a UUVs servindo projetos de ICM dependerá sobretudo do objetivo do projeto e da necessidade de o mesmo utilizar apenas uma pequena área do ambiente marinho a ser partilhada com outras atividades ou, pelo contrário, de o projeto reclamar o uso exclusivo de uma determinada área do ambiente marinho.

Pequenos projetos de ICM pura que sejam implementados em águas sob soberania ou jurisdição nacional que não exijam o uso exclusivo de determinada área do ambiente marinho, apenas carecem de uma autorização emitida pelo Ministério do Mar ou pelo Ministério dos Negócios Estrangeiros, no caso de entidades estrangeiras. Em qualquer caso, o documento de investigação deverá mencionar a existência de UMs, enquanto método de investigação, assim como especificar as datas da sua remoção do ambiente marinho, inclusive daqueles UMs que se encontrem afundados ou encalhados.

Os projetos de ICM pura que exijam o uso exclusivo de uma determinada área do ambiente marinho estão sujeitos à emissão de um título de utilização privativa do espaço marítimo nacional. Para além da informação relativa aos UMs que deve ser providenciada no documento de investigação, os requerentes devem ainda especificar as medidas de sinalização e os padrões de segurança a serem adotados pelos UMs, mencionar as infraestruturas de apoio terrestres existentes, assim como incluir, no contrato de seguro, uma cláusula destinada a cobrir os danos causados por estes. Cumprindo os UMs com as normas legislativas e regulamentares em vigor, particularmente no que se refere à proteção e preservação do ambiente marinho e não interferindo com os outros usos legítimos do mar, devem os mesmos ser considerados como um método apropriado de investigação não devendo a sua utilização, em princípio, ser recusada.

Os projetos de ICM implementados no mar territorial, na ZEE e na plataforma continental até às 200 milhas náuticas adjacentes à Região Autónoma dos Açores e da Madeira, devem ter em atenção as competências das Regiões Autónomas neste domínio.

Os projetos de ICM aplicada estão sujeitos a legislação específica. No caso da pesca, a lei não especifica, de forma detalhada, a informação que deve ser submetida. No setor petrolífero e geológico, a legislação nacional não impõe a prestação de informação relativamente ao equipamento utilizado, porém, determina que o requerente submeta informação sobre os meios técnicos disponíveis bem como qualquer outra informação que possa ser relevante para a avaliação do projeto, recomendando-se, portanto, que o uso de UMs seja mencionado no projeto de investigação.

Ao contrário do que acontece com as aeronaves não tripuladas sujeitas a registo e a seguro de responsabilidade civil obrigatório, independentemente da atividade para a qual são usadas, a utilização de UMs em projetos de ICM ou em qualquer outra atividade não depende da existência de registo nem de seguro, sendo livre, desde que se considere que os mesmos são um método apropriado de investigação.

No âmbito de projetos de ICM diversas obrigações recaem sobre as entidades responsáveis pela operação de UMs, nomeadamente a obrigação de informação quanto à sua existência, a obrigação de adotar todas as medidas necessárias para assegurar o bom estado ambiental do ambiente marinho, a obrigação de adotar as medidas de sinalização e de segu-

rança destinadas a assegurar que os UUVs navegam em segurança e a obrigação de proceder à sua remoção, mesmo no caso em que os mesmos se encontrem afundados ou encalhados.

Para além disso, a entidade que é responsável pelo projeto de ICM deverá assegurar que as normas de proteção de dados pessoais são cumpridas. No entanto, por regra, os projetos de ICM não terão como destinatários pessoas, e mesmo existindo a captura de dados pessoais, poderão os mesmos ser enquadrados na exceção legislativa que exclui a obrigatoriedade de manter informação destinada a identificar o sujeito dos dados.

A entidade responsável pelo projeto de ICM poderá vir a ser objetivamente responsável pelos danos causados por UUVs nos termos do artigo 500.º do Código Civil apenas se os seus requisitos se verificarem. Por isso, para futuro, será relevante que se discuta a eventual criação de um regime de responsabilidade civil objetiva obrigatória, tal como acontece para os danos causados por veículos terrestres e aeronaves não tripuladas.

Os UUVs apenas estarão sujeitos à obrigatoriedade de contratação de seguro no caso em que sejam usados em atividades para as quais o seguro obrigatório seja exigido. Caso contrário, podem operar livremente nas águas sob soberania ou jurisdição nacional sem estarem sujeitos a qualquer tipo de seguro, o que contrasta com o regime jurídico das aeronaves não tripuladas, onde a lei impõe a existência de um seguro obrigatório independentemente da atividade na qual são usados, quando a massa máxima operacional da aeronave seja superior a 900 gramas.

As disposições do Código Comercial relativas ao abalroamento de navios não devem, na nossa perspetiva, ser aplicadas a casos em que estejam em causa UUVs, na medida em que as suas diferentes características, nomeadamente em termos de tamanho e *endurance* parecem ser suficientes para reclamar a aplicação de outro tipo de responsabilidade. Esta solução deve, todavia, ser discutida considerando a aptidão dos UUVs para causar danos, tendo em conta a sua natureza, estrutura ou qualidade, bem como o dever de vigilância que deve ser cometido ao operador.

As controvérsias relativas à utilização de navios não tripulados e UUVs em águas sob soberania e jurisdição nacional podem ser submetidas a diferentes categorias de tribunais nacionais dependendo, em última instância, da forma como a ação é proposta e configurada pelo autor.

As provas que sejam recolhidas por UUVs podem ser submetidas perante os tribunais nacionais na categoria de prova documental devendo, quando tais provas incluam vídeos ou sons, ser providenciadas através de meios técnicos que permitam ao tribunal a sua reprodução. Em processos cíveis, os vídeos e os sons apresentados devem ser impugnados sob pena de fazerem fé em juízo dos factos que representam, embora mesmo neste caso, o tribunal ainda os possa considerar no âmbito das presunções judiciais. Em processo penal, a prova documental capturada por UUVs, incluindo as reproduções mecânicas recolhidas em propriedade privada sem autorização, será provavelmente admitida com base no argu-

mento que o seu uso é de interesse público. Esta questão poderá, contudo, ser controversa. Os sons captados por UMs, estão, por sua vez, sujeitos ao regime jurídico das escutas telefónicas e, portanto, apenas podem ser admitidos para determinada categoria de crimes e cumpridas determinadas condições impostas por lei. A prova documental submetida é apreciada pelo juiz segundo a sua livre experiência e convicção devidamente justificada e fundamentada na sentença.

A existência de um regime jurídico nacional completo, abrangente e regulador dos navios não tripulados e dos UMs requer a revisão de diversas leis e regulamentos em vigor. O presente relatório identifica essas leis e regulamentos e providencia um conjunto de sugestões de alteração de normas específicas, nomeadamente no que se refere à tripulação, à responsabilidade civil, ao seguro e às atividades de ICM de forma a promover-se o uso de navios não tripulados e UMs no âmbito do sistema marítimo português.

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ACRONYMS AND ABBREVIATIONS

AIR CENTER Atlantic International Research Center

AMN National Maritime Authority – Autoridade Marítima Nacional

ANACI National Authority of Civil Aviation – Autoridade Nacional de Aviação Civil

CC Civil Code

CLCS Commission on the Limits of the Continental Shelf

COLREGS Convention on the International Regulation for Preventing Collision at Sea

CPC Code of Civil Procedures

CPP Code of Criminal Procedures

CPTA Code of Administrative Courts Procedures

CRP Constitution of the Portuguese Republic

DGEG General Directorate of Natural Resources, Maritime Services and Safety –

DGRM Direção Geral de Recursos Naturais, Segurança e Serviços Marítimos

EEZ Exclusive Economic Zone

EIA Environmental impact assessment

ENSE National Authority for the Energetic Sector E.P.E– Entidade Nacional para o Setor Political and Administrative Statute of the Autonomous

EPARAA	Region of Azores
EPARAM	Political and Administrative Statute of the Autonomous Region of Madeira
ETAF	Statute of Administrative and Tax Courts
EU	European Union
GAIRS	Generally Accepted International Rules and Standards
ICJ	International Court of Justice
ILO	International Labour Organization
IMO	International Maritime Organization
ITLOS	International Tribunal for the Law of the Sea
LSTS	Underwater Systems and Technology Laboratory- Laboratório de Sistemas e Tecnologia Subaquática
MARINFOI	Integrated Platform for Marine Data Acquisition and Analysis Project
MSR	Marine Scientific Research
NATO	North Atlantic Treaty Organization
PCA	Permanent Court of Arbitration
SAM	System of the Maritime Authority – Sistema de Autoridade Marítima
SARC	International Convention on Maritime Research and Rescue
UNCLOS	The United Nations Convention on the Law of the Sea
UAVS	Unmanned Aerial Vehicles
UMS	Unmanned Maritime Systems
UMV	Unmanned Maritime Vehicle
UMVS	Unmanned Maritime Vehicles
UN	United Nations Organization
USVS	Unmanned Surface Vehicles
UUVS	Unmanned Underwater Vehicles

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Introduction

1. Nature of the project

MarInfo – Integrated Platform for Marine Data Acquisition and Analysis is a multidisciplinary project implemented through a joint partnership among different institutions within the University of Porto. The main objective of the project is to develop a coherent framework for the acquisition and processing of data from the marine environment in the North of Portugal. This includes providing contributions for the development of a legal regime applicable to the use of new emerging technologies, particularly unmanned vessels and unmanned maritime vehicles (UMVs). This report is one of the deliverables of task 4 conceived to discuss the prospects of a legal framework applicable to unmanned vessels and UMVs based on the analysis of the United Nations Convention on the Law of the Sea (UNCLOS)¹ and the national legislation. An analysis of the specific legal regime provided for in other international conventions rather than the UNCLOS is not in the scope of this report.²

2. Terminology

The increasing use of different technologies at sea is a natural manifestation of the unprecedented progress witnessed over recent years in robotics and autonomous

1 The United Nations Convention on the Law of the Sea (Montego Bay, 10 December 1982, in force 16 November 1994); in Portugal, see Resolution of the Assembly of the Republic No. 60-B/97, of 14 October, available at <https://dre.pt/application/file/a/152861>; and Decree of the President of the Republic No. 67-A/97, of 14 October, available at <https://dre.pt/application/file/a/152860>.

2 For such analysis, see R Veal, et. al., *Report on Liability for operations in Unmanned Maritime Vehicles with Differing Levels of Autonomy*, Final Report, (University of Southampton, 2016).

systems. Unmanned maritime systems (UMS) have long been used for military purposes.³ However, recent technological developments in computation, communication, sensing, control, and materials⁴ have underpinned the emergence of more advanced intelligent systems, which are gradually being expanded beyond military activities. These systems comprise several types of crafts, including unmanned vessel, in an early stage of development, and UMVs, which are already being used both on the surface and underwater.⁵ UMVs vary in size, type, function, endurance, degrees and levels of autonomy, and can be employed in different kinds of activities providing a window of opportunities not only for marine scientific research (MSR) activities but also for oceanographic operations, environmental, search and rescue activities, as well as for monitoring, surveillance and enforcement operations.⁶ Recent advances and new capabilities are also expanding UMVs' commercial potential, which are now easily available for private companies and individuals to purchase.

The first challenge one faces when analyzing the legal framework applicable to this new reality starts with the variety of different types of vehicles being developed, notably, ground, underwater, surface, and aerial vehicles. This is aggravated by the fact that there is no legal accepted definition of different types of crafts and by some terminology confusion as well.⁷

As a result, for the purpose of this report, the following definitions are adopted:

- **Unmanned Maritime Systems (UMS):** are defined by the North Atlantic Treaty Organization (NATO) as unmanned systems operating in the maritime environment (subsurface, surface, air) whose primary component is at least one unmanned vehicle.⁸ Therefore, for the purpose of this report, UMS com-

3 J Kraska, 'The Law of Unmanned Naval Systems in War and Peace' (2010) 5(3) *Journal of Ocean Technology*, 43-68, at p. 44; B Gogarty and M Hagger, 'The Laws of Man over Vehicles Unmanned: The Legal Response to Robotic Revolution on Sea, Land and Air' (2008) 19(1) *Journal of Law, Information and Society*, 73-145, at p. 77; S Monoley 'Legal and Practical Challenges Associated with use of Unmanned Aerial Vehicles in the Maritime Environment' (2016) 11 *Soundings Sea Power Centre Australia*, at pp. 1-22.

4 J Borges de Sousa, 'Networked Vehicle Systems: A Glimpse at Future Capabilities for Safer Seas' in M C Ribeiro and E J Molenaar (eds), *Maritime Safety and Environmental Protection in Europe Multiple Layers in Regulation and Compliance* (Marsafenet, Porto-Utrecht, 2015), 239-259, at p. 239, ebook available at <http://www.marsafenet.org/marsafenet/wp-content/uploads/2015/07/Ebook-Maritime-Safety-and-Environmental-Protection-in-Europe-Porto-Conference-MARSAFENET-June-2015.pdf>.

5 In the United States of America, UMVs are also referred as seagoing drones or robots; see C H Allen, 'The Seabots are Coming Here: Should they be Treated as Vessels?' (2012) 65(4) *Journal of Navigation*, 749-752, at p. 749, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2043116.

6 For more information on the use of technology in maritime enforcement activities see C Rahman, 'Use of Technology in Maritime Regulation and Enforcement' in R Warner and S Kaye (eds), *Routledge Handbook of Maritime Regulation and Enforcement* (Routledge, London, New York, 2016), at pp. 363-377.

7 Sousa (n 4), at p. 241.

8 See 'Guidance for developing Maritime Unmanned Systems (MUS) capability', NATO Combined Joint Operations from the Sea Centre of Excellence, (2012), at p. 6, available at <https://info.publicintelligence.net/CJOSCOE-MUS.pdf>.

prise not only unmanned maritime vehicles themselves, and complementary infrastructures, such as vessels, ships, shore-based facilities, supporting personnel, but also any other complementary equipment, including unmanned aerial vehicles, when operating in the maritime environment.

- **Unmanned Maritime Vehicles (UMVs):** refers to untethered self-propelled and self-powered vehicles with the capacity of movement without a human presence on board. UMVs can integrate different types of vehicles, as follows:⁹
 - **Unmanned Surface Vehicles (USVs):** are crafts that work without a physical connection to any other device and operate on the surface.
 - **Unmanned Underwater Vehicles (UUVs):** are crafts that work without a physical connection to any other device and operate underwater.¹⁰
 - **Remotely Operated Vehicles:** are tethered underwater devices physically connected to a main vessel or ship.
- **Unmanned Aerial Vehicles (UAVs):** are crafts that work without a physical connection to any other device and operate in the atmosphere.
- **Unmanned vessels:** refers to vessels to be used in maritime transportation, in MSR as well as in other activity with the main feature of having no human presence on board.
- **Unmanned State vessels:** refers to warships, naval auxiliaries and government ships operated for non-commercial purposes with the main feature of having no human presence on board.

This report uses indistinctively the terms ‘vessel’ and ‘ship’. The terms ‘unmanned vessels’ and ‘unmanned merchant vessels’ are also used as synonym. Specific reference to unmanned warships, unmanned naval auxiliaries and unmanned government ships operated for non-commercial purposes is only done when the legal regime applicable so justifies. If this is not the case, the short formula ‘unmanned State vessels’ is employed. This report uses the term ‘regular vessel’ or ‘regular ship’ to refer to those vessels or ships, which are manned in the traditional way and have a master or a commander and a crew on board.

⁹ See *Safety and Regulations for European Unmanned Maritime Systems, SARUMS Best Practice Guide for Unmanned Maritime Systems, Handling, Operations, Design and Regulations*, European Defense Agency Research and Technology, Maritime Systems and Environments, Unmanned Maritime Systems Safety and Regulations, 2015, at p. 3.

¹⁰ This corresponds to the terminology used in SARUMS, *Ibid*.

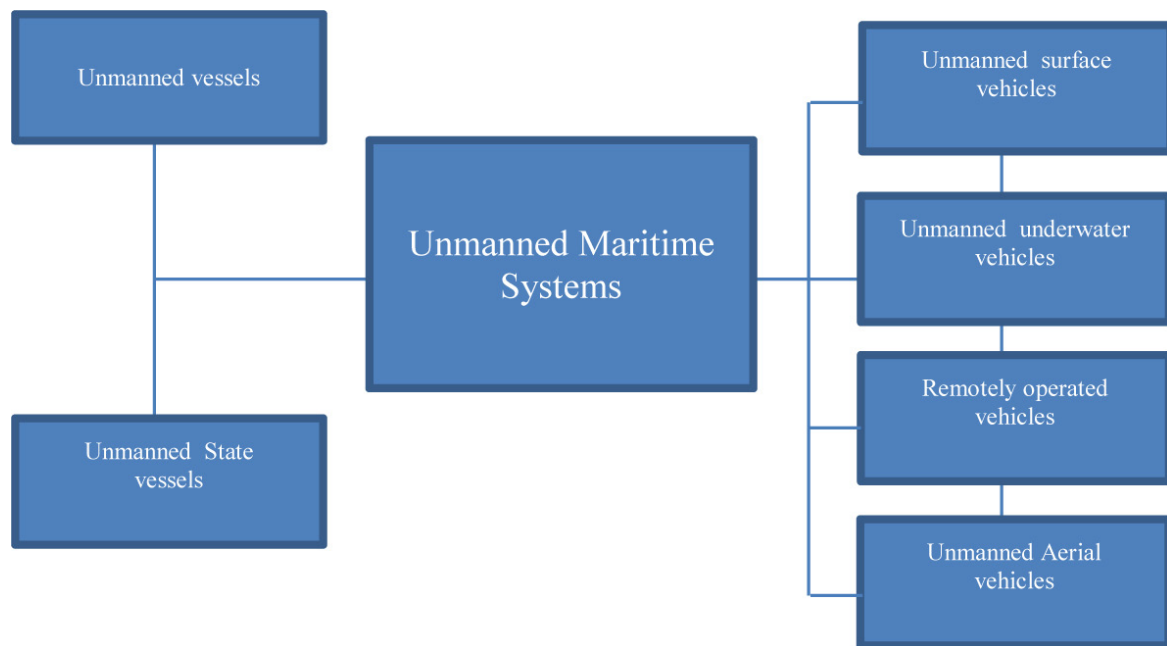


Figure 1 - Typology of Unmanned Maritime Systems

It is also important to make a distinction between automatic and autonomous systems. In an automatic system, the ‘system will do exactly as programmed, it has no choice. Automatic crafts are pre-programmed and remotely controlled to operate at the sea as they were predetermined to without self-learning capacities. In contrast, autonomous means that a system has a choice to make free of outside influence, i.e., an autonomous system has free will.’¹¹

In accordance with SARUMS there are mainly six methods for controlling functions: 0) human on board, 1) operated, 2) directed, 3) delegated, 4) monitored, 5) autonomous.¹² Nowadays, most UMVs operating at sea are not fully autonomous, since they lack sensing and reasoning capabilities for that¹³ and mostly act exactly as they were programmed to without self-learning skills.¹⁴

11 B T Clough ‘Metrics, Schmetrics! How The Heck Do you Determine A UAV’s Autonomy Anyway?’ (Performance Metrics for Intelligent Systems (PerMIS) Conference, Mayland, 15 August 2002), available at <http://www.dtic.mil/dtic/tr/fulltext/u2/a515926.pdf>.

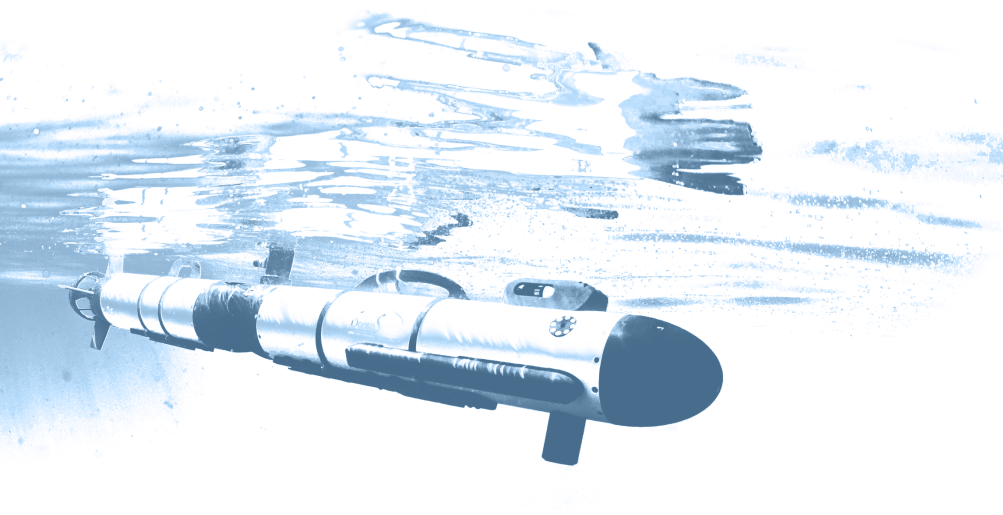
12 Best Practice Guide, SARUMS (n 9), at p. 7.

13 Sousa (n 4), at p. 243.

14 For more information on the legal framework regarding artificial intelligence, see M U Scherer, ‘Regulating Artificial Intelligence Systems: Risks, Challenges, Competences and Strategies’ (2016) 29(2) *Harvard Journal of Law & Technology*, 354-398.

3. Methodology

The preparation of this report was based on a method of qualitative research. A full literature review, including an analysis of books, academic papers, academic journals, reports, and prior surveys and studies was carried out. The UNCLOS and key national laws and regulations that may apply to unmanned vessels and UUVs operations were thoroughly analyzed. Other relevant international conventions were considered. Consultations with the Underwater Systems and Technology Laboratory /*Laboratório de Sistemas e Tecnologia Subaquática* (LSTS) within the Engineering Faculty of University of Porto/ *Faculdade de Engenharia da Universidade do Porto* were undertaken for clarification regarding technical specifications of UUVs. A field trip to the *Max Planck Institute for Comparative Public Law and International Law* was also organized.



PART 1

INTERNATIONAL LAW OF THE SEA

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Chapter 1

UNMANNED VESSELS AND UMMVs AND THE INTERNATIONAL LAW

1. An international legal gap

The international law of the sea, which is one of the oldest branches of international law,¹⁵ was codified in the UNCLOS. Commonly referred as the '*Constitution for the Oceans*',¹⁶ the UNCLOS systematizes widely accepted rules governing all uses of the oceans, their resources and the activities undertaken therein, including the definition of the rights and obligations of the flag and coastal States. Aimed at promoting a legal order for peaceful uses of the world's seas and oceans, with due regard for the sovereignty of the States, the UNCLOS has been largely adhered to by States,¹⁷ and by the European Union (EU) itself.¹⁸ As a framework convention, many of the general UNCLOS dispositions are implemented and given effect through specific operative rules and regulations either set forth by other international instruments or by domestic legis-

15 Y Tanaka, *The International Law of the Sea*, (2nd ed., USA, Cambridge University Press, 2015), at p. 3.

16 Tommy T.B. Koh, who chaired the Singapore delegation and served as the President of the III United Nations Conference on the Law of the Sea, was the first one to refer the UNCLOS as the '*Constitution for the Oceans*'. His remark is available at http://www.un.org/Depts/los/convention_agreements/texts/koh_english.pdf.

17 As of 10 May 2019, the UNCLOS has 168 Contracting Parties, see https://treaties.un.org/pages/ViewDetailsIII.aspx?src=TREATY&mtdsg_no=XXI-6&chapter=21&Temp=mtdsg3&clang=en.

18 Council Decision of 23 March 1998 concerning the conclusion by the European Community of the United Nations Convention of 10 December 1982 on the Law of the Sea and the Agreement of 28 July 1994 relating to the implementation of Part XI thereof, available at http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.1998.179.01.0001.01.ENG&toc=OJ:L:1998:179:TOC.

lation. Conversely, other UNCLOS provisions directly create rights and obligations to States, and are immediately applicable and capable of being enforced by States.

The UNCLOS was prepared prompted by the desire to ‘*settle, in a spirit of mutual understanding and co-operation, all issues relating to the law of the sea.*’¹⁹ Yet, the UNCLOS does not have provisions referring to unmanned vessels and UUVs.

In the same vein, other sources of international law, as spelled out in Article 38 of the Statute of the International Court of Justice (ICJ),²⁰ namely the international conventions adopted for the implementation of the framework established by the UNCLOS, such as the system of the International Maritime Organization (IMO)²¹ do not directly recognize the existence of unmanned vessels and UUVs.²²

It is a matter of fact, however, that both UUVs and unmanned ships are a new reality, whose operations raise several legal challenges that the international law needs to face.²³ This is particularly relevant in the case of UUVs that are already being used for different activities, which require some minimum guidelines to be put forward. Developments in unmanned vessels are not so advanced, but the maritime industry is keen to move forward and increasing investment to support the delivery of unmanned ships in the near future has been made.²⁴

This report was prepared assuming that this regulatory gap does not prejudice the application of the existing principles and rules of international law to UUVs and

19 See UNCLOS preamble.

20 The ICJ is the principal organ of the United Nations Organization (UN). The ICJ Statute lays down the main primary sources of international law, such as international conventions, customary international law, and general principles of law and, as auxiliary sources, the decisions of international courts, and the teachings of the most highly qualified publicists; see the ICJ Statute available at <https://www.icj-cij.org/en/statute>; Member of the UN are automatically Party to the Statute of the ICJ. Portugal is a member of the UN since 14 December 1955.

21 The IMO is the UN Specialized Agency with the mission to promote safe, secure, environmentally sound, efficient and sustainable shipping, including prevention of pollution from ships. The IMO is also the competent international organization regarding navigational matters, see the IMO webpage, available at <http://www.imo.org/en/Pages/Default.aspx>.

22 K Bork, J Karstensen, M Visbeck, A Zimmermann, ‘The Legal Regulations of Floats and Gliders – In Quest of a New Regime?’ (2008) 39 *Ocean Development & International Law*, 298-328; and M Nordquist, ‘Gaps in the United Nations Convention on the Law of the Sea’ in M C Ribeiro (coord), *30 Years after the Signature of the United Nations Convention on the Law of the Sea: The Protection of the Environment and the Future of the Law of the Sea* (Coimbra Editora, 2014), 169-178, at p. 170.

23 The legal implications associated with the use of UUVs were mainly addressed in three documents: *The Maritime Unmanned Navigation through Intelligence Networks Funding Scheme, Munin Project, Legal and Liability Analysis for Remote Controlled Vessels* (2013), available at <http://www.unmanned-ship.org/munin/wp-content/uploads/2013/11/MUNIN-D7-2-Legal-and-Liability-Analysis-for-Remote-Controlled-Vessels-UCC-final.pdf>; *Best Practice Guide*, SARUMS (n 9); and Veal, (n 2).

24 See, for instance, the case of Rolls-Royce position regarding the development of autonomous ships, available at <http://www.rolls-royce.com/~media/Files/R/Rolls-Royce/documents/customers/marine/ship-intel/rr-ship-intel-aawa-8pg.pdf>.

unmanned vessels' operations, based on the adoption of an evolutionary interpretation of the UNCLOS that can be legally defended if supported by State's practice.

2. Grounds for an evolutionary interpretation of the UNCLOS

Interpretation of treaties is regulated under Articles 31 and 32 of the Vienna Convention on the Law of the Treaties,²⁵ which reflects customary international law.²⁶ Accordingly, treaties shall be interpreted in good faith, in accordance with the ordinary meaning to be given to the terms of a treaty in its context, and in the light of its object and purpose.

As noted by the ICJ '*Interpretation must be based above all upon the text of the treaty. As a supplementary measure recourse may be had to means of interpretation such as the preparatory work of the treaty.*'²⁷ The adoption of a static approach in the interpretation task reflects the idea that treaties shall be interpreted by reference to the intention of the parties and the circumstances prevailing when they were adopted.²⁸ In addition, the contemporaneous interpretation principle gives more importance to the meaning of the terms of a treaty at the time of its conclusion rather than when the treaty is being implemented.²⁹

However, Article 31(3) of the Vienna Convention gives room for considering the temporal element of interpretation, and for the adoption of a more dynamic approach, also labeled as evolutionary interpretation, which has been defended in different contexts. There is no standing definition of the term evolutionary approach in the context of treaty interpretation, but the concept is based on the idea that the meaning of a treaty may change over time. This is particularly useful for determin-

25 Convention on the Law of the Treaties (Vienna, 23 May, 1969, in force 27 January 1980); in Portugal, see Resolution of the Assembly of the Republic No. 67/2003, of 7 August, and Decree of the President of the Republic No. 46/2003, of 7 August, available at <https://dre.pt/application/file/a/645669>.

26 O Dörr, 'Article 31' in O Dörr and K Schmalenbach (eds), *Vienna Convention on the Law of Treaties A Commentary Vol. 1* (Berlin, Springer, 2012) 521-570, at p. 533; The International Tribunal for the Law of the Sea (ITLOS) Seabed Dispute Chamber, *Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*, Advisory Opinion (2011) para. 57, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_17/adv_op_010211.pdf.

27 See ICJ '*Territorial Dispute*' (*Libyan Arab Jamahiriya v Chad*) Judgment (1994) para. 41, available at <https://www.icj-cij.org/files/case-related/83/083-19940203-JUD-01-00-EN.pdf>.

28 See ICJ Case '*Concerning the Land and Maritime Boundary between Cameroon and Nigeria*' (*Cameroon v Nigeria*) Judgment (2002) para. 359, available at <https://www.icj-cij.org/files/case-related/94/094-20021010-JUD-01-00-EN.pdf>.

29 O Dörr and Schmalenbach, 'Article 31' (n 26), at p. 533; see also M Dawiowicz, 'The Effect of the Passage of Time on the Interpretation of Treaties Some Reflections on Costa Rica v. Nicaragua' (2011) 24 *Leiden Journal of International Law*, at pp. 201-222.

ing the meaning of generic terms, whose significance may change regardless of the intervention of the parties.³⁰

The evolutionary interpretation considers in the process of interpretation the ‘*present-day state of scientific knowledge*.’³¹ Based on the teleological principle of interpretation, this perspective promotes a more flexible and up-to-date methodology, since it seeks to determine the meaning of a treaty at the time of its implementation in order to give the treaty its fullest effect.

This methodology perceives the treaty as a ‘*living instrument*’³² and is very often invoked in the interpretation of human rights treaties,³³ environment law,³⁴ as well as in the context of the law of the sea,³⁵ notably in the protection of marine biodiversity.³⁶

Like other areas of public international law, the international law of the sea is ‘*in a state of flux due to the changing needs, interests and opinions of the international community*’,³⁷ and it claims an evolutionary, yet well-grounded and well justified, interpretation of its dispositions.

Bringing this theory to this report, it is defended that the UNCLOS legal framework shall apply to the operations and activities of unmanned ships and UMS without prejudice to the approval of specific regulations that may be deemed necessary in the near future.

30 See ICJ Case ‘*Concerning the Gabčíkovo-Nagymaros Project*’ (*Hungary v. Slovakia*) Judgement (1997) para. 8, available at <https://www.icj-cij.org/files/case-related/92/092-19970925-JUD-01-00-EN.pdf>.

31 See ICJ Case *Concerning Kasikili/Sedudu Island (Botswana v. Nigeria)* Judgment (1999) para. 20, available at <https://www.icj-cij.org/files/case-related/98/098-19991213-JUD-01-00-EN.pdf>.

32 This concept was firstly conceptualized by the European Court of Human Rights in the *Tyrer Case (Tyrer v. The United Kingdom)* Merits Judgment (1978) para. 31, available at [https://hudoc.echr.coe.int/eng#{"fulltext":\["tyrer"\],"documentcollectionid2":\["GRANDCHAMBER","CHAMBER"\],"itemid":\["001-57587"\]}.](https://hudoc.echr.coe.int/eng#{"fulltext":["tyrer"],"documentcollectionid2":["GRANDCHAMBER","CHAMBER"],"itemid":["001-57587"]}.)

33 More information on the dynamic interpretation of human rights, see M Fitzmaurice, ‘Dynamic (Evolutive) Interpretation of Treaties and the European Court of Human Rights’ in A Orakhelashvili and S Williams (eds.), *40 years of the Vienna Convention on the Law of the Treaties* (British Institute of International and Comparative Law, London, 2010), at pp. 55-96.

34 See M N Shaw, *International Law* (7th ed., Cambridge University Press, Cambridge, 2014), at pp. 679-680.

35 See ICJ ‘*Aegean Sea Continental Shelf*’ Case (*Greece v Turkey*) Judgement (1978) para. 77, available at <https://www.icj-cij.org/files/case-related/62/062-19781219-JUD-01-00-EN.pdf>.

36 M C Ribeiro, *A Proteção da Biodiversidade Marinha Através de áreas Protegidas nos Espaços Marítimos sob Soberania ou Jurisdição do Estado: Discussões e Soluções Jurídicas Contemporâneas O Caso Português* (Coimbra Editora, 2013), at p. 528; and F L Bastos, ‘O contributo do Tribunal Internacional do Direito do Mar para a clarificação dos poderes dos Estados costeiros na zona económica exclusiva’ in M C Ribeiro (ed), *20 anos da entrada em vigor da CNUDM: Portugal e os Recentes Desenvolvimentos no Direito do Mar* (Centro Interdisciplinar de Investigação Marinha e Ambiental, Faculdade de Direito da Universidade do Porto, 2015), at p. 43.

37 E J Molenaar, ‘New Maritime Zones and the Law of the Sea’ in H Ringbom (ed), *Jurisdiction Over Ships - Post-UNCLOS Developments in the Law of the Sea* (Brill Nijhoff, Leiden, Boston, 2015), 249-277, at p. 249.

As previously mentioned, the UNCLOS does not make any reference neither to UUVs nor to unmanned ships for the simple fact that when the UNCLOS was negotiated these types of vehicles, although known, were in an early stage of development and those available were mainly employed in a military aerial context.³⁸ It was only in the 1990s that UUVs gained some attention with the exploration and discovery of undersea wrecks.³⁹

This report defends that there are no reasons to exclude UUVs from the comprehensive legal framework provided for in the UNCLOS for the simple fact that they were in an early stage of development at the time of its adoption and because they are not specifically regulated within the UNCLOS wording.

Depending on the concrete and the precise features of each unmanned vessel and each unmanned maritime vehicle (UUV), and considering that the UNCLOS introduces no exception regarding crafts that have the particular feature of being unmanned, it seems possible to include unmanned vessels in the scope of the provisions drafted for vessels and ships. This is the position that has been defended regarding UAVs, which shall not be excluded from the legal regime applicable to aircraft for the simple fact that they are unmanned.⁴⁰

UUVs utilized for different ocean activities are also subject to the UNCLOS provisions. This report discusses the legal regime that is applicable to UUVs used for MSR and classified as equipment under Part XIII, and argues that rules and regulations of Part XIII regarding MSR's equipment can be used by analogy to regulate UUVs employed for other purposes.

The application of the UNCLOS to unmanned ships and UUVs operations is two-fold: first, to fill in the existing regulatory gap by extending, without prejudice to some necessary adaptations, the application of the UNCLOS dispositions regarding manned vessels to unmanned ones, and by extending the application of the provisions of Part XIII of the UNCLOS regarding equipment to UUVs operating in the marine environment for other purposes; second, to ensure that the objective of the UNCLOS to settle all issues relating to the law of the sea and to establish a legal order for the oceans, is achieved.⁴¹

38 Gogarty and Hagger (n 3), at p. 77.

39 *Ibid.*, at p. 79.

40 See I Henderson and B Cavanagh, 'Unmanned Aerial Vehicles: Do They Pose Legal Challenges?' in H Nasu, R McLaughlin (eds), *New Technologies and the Law of Armed Conflict* (Springer, Canberra, 2014), 193-212, at p. 197.

41 See UNCLOS preamble.

The adoption of an evolutionary interpretation of the UNCLOS does not fill in all the existing gaps regarding the legal regime applicable to unmanned vessels and UUVs. Nevertheless, it is a solution that is able to promote a uniform State practice and consistency in the legal regime applicable to unmanned ships and UUVs.

Chapter 2

UNMANNED VESSELS UNDER THE UNCLOS

Section 1

DELIMITATION OF THE CONCEPT OF VESSEL

1. Typology of vessels

The UNCLOS indistinctively refers to vessels and ships,⁴² but it does not provide any authoritative definition.⁴³ In practice, the international legal context in which the terms ‘vessel’ and ‘ship’ are used varies greatly, so an adoption of a single definition to cover all realities would probably be impractical.⁴⁴ This idea is highlighted by Lowe, who defends that the terms ‘vessel’ and ‘ship’ are commonly used in diverse legal backgrounds not having the same meaning at all.⁴⁵ This was also the position invoked by Finland on its Memorial before the ICJ in the Case ‘*Concerning Passage Through the Great Belt*’,

42 In the Portuguese legislation: vessel is translated as ‘embarcação’ while ship is translated as ‘navio’.

43 D O’Connel, *The International Law of the Sea* Vol II, (ed. I.A. Shearer, 1984), at pp. 747-750.

44 J E Noys, ‘Interpreting the 1982 Law of the Sea Convention and Defining its Terms’ in G K Walker (ed), *Definitions for the Law of the Sea - Terms Not Defined by the 1982 Convention* (Martinus Nijhoff Publishers, Leiden, Boston, 2012), 46-78, at p. 60.

45 A V Lowe, ‘Ships’ in N Boschiero, T Scovazzi, et al., (eds), *International Courts and the Development of International Law Essay in Honour of Tullio Treves* (Springer, The Hague, 2013), at p. 296.

which concluded that the terms ‘ship’ or ‘vessel’ have no single fixed meaning in international law, because its definition varies from one context to another.⁴⁶

Despite the lack of definition, the UNCLOS provides some insights into and guidance on the typology of vessels, mainly based on a functional approach,⁴⁷ which categorize vessels considering the public or the private function performed. Accordingly, government or State vessels are mainly warships or ships operated for non-commercial purposes. In both cases, the vessel is a military or a political instrument of the State.⁴⁸ This contrasts with merchant ships, which include privately owned ships and all non-military government ships partly or exclusively engaged in a commercial service.⁴⁹

This report argues that this typology can be extended to unmanned vessels.

1.1. Unmanned warships and unmanned government ships operated for non-commercial purposes

For the purpose of the UNCLOS, a warship is defined in Article 29 as ‘*a ship belonging to the armed forces of a State bearing the external marks distinguishing such ships of its nationality, under the command of an officer duly commissioned by the government of the State and whose name appears in the appropriate service list or its equivalent, and manned by a crew which is under regular armed forces discipline.*’ Warships include different type of craft, namely ‘*combatants, such as corvettes, frigates, destroyers, cruisers, aircraft carriers and various types of amphibious assault ships, and submarines.*’⁵⁰

The UNCLOS first requirement imposing the existence of a distinguished external marking to indicate the nationality and the military nature of the craft can be easily observed by unmanned warships. Yet, further requirements imposed by Article 29 of the UNCLOS may claim some clarifications since an unmanned warship is, by its nature, devoid of a commander and crew.⁵¹ It can be contended that, under the spirit

46 ICJ Case ‘Concerning Passage Through the Great Belt’ (Finland v Denmark) Finnish Memorial (1991) paras. 444, 473 and 504, available at <https://www.icj-cij.org/files/case-related/86/6885.pdf>.

47 F Wegelein, *Marine Scientific Research*, (Martinus Nijhoff Publishers, Leiden, Boston, 2005) 133; B Oxman, ‘The Regime of Warships Under the United Nations Convention on the Law of the Sea’ (1984) 24(4) *Virginia Journal of International Law*, 809-863, at p. 813.

48 Oxman *Ibid.*, at p. 826.

49 T K Thommen, *Legal Status of Government Merchant Ships in International Law*, (Martinus Nijhoff, The Hague, 1962), at p. 154.

50 See J Kraska, ‘Military Operations’ in D R Rothwell, A G O Elferink, K N Scoot, T Stephens (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, the United Kingdom, 2015), 865-887, at p. 870.

51 R McLaughlin, ‘Unmanned Naval Vehicles and the Law of Naval Warfare’ in H Nasu, R McLaughlin (eds), *New Technologies and the Law of Armed Conflict* (Springer, Canberra 2014), 229-246, at p. 240.

of the UNCLOS, the terms ‘*under command*’ and ‘*manned*’, can be interpreted in a flexible and dynamic way to cover distant and shore-based commanders and crew as well as pre-programmers of unmanned warships provided they are under the discipline of the armed forces and exercise authority over the unmanned warship.⁵² In this sense, having a commander and a crew on board is not regarded as essential for the concept of warship. The same interpretation has been previously advanced in the context of UAVs, which clearly admits the possibility of a military UAV to be remotely controlled.⁵³ In the light of this position, it is not the physical presence on board that is relevant to qualify an aircraft as a military one, but rather the control that is effectively exercised by the armed forces.⁵⁴

An unmanned warship is only included in the category of warship as long as the armed forces retain and maintain control over it. An unmanned warship abandoned or whose commander and crew have mutinied and taken control of the vessel is not deemed to be part of the armed forces of a State and consequently a warship.⁵⁵

Naval auxiliaries mentioned in Article 236 of the UNCLOS comprise crafts used to support naval operations in different ways, by providing replenishment of fuel, ammunition, food and other necessary supplies, by acting as a repair station, or even transporting soldiers. Naval auxiliaries are, in principle, subject to the same legal regime as warships.⁵⁶ In this sense, naval auxiliaries that are unmanned shall also be subject to this legal regime.

Along with warships and naval auxiliaries, Part II Section 3 Subsection C of the UNCLOS also refers to ‘government ships operated for non-commercial purposes.’ These are ship used by the State, in all forms and levels of State administration, to perform acts vested with public and authoritative powers.⁵⁷ It comprises supply ships, hospital ships, coastguard vessels, icebreakers, customs vessels, immigration vessels, hydrographic survey and research vessels, royal and presidential ships,⁵⁸ as well as any other

52 Captain A Norris, *Legal Issues Relating to Unmanned Maritime Systems Monography*, (The United States Naval War College, 2013), at pp. 28-29, available at <https://www.hsdl.org/?view&did=731705>.

53 The term ‘*military aircraft*’ is defined in the 1923 Hague Rules of Aerial Warfare. Articles 3 and 14 in conjunction require for an aircraft to be military that i) the aircraft shall be commissioned by the armed forces of a State, ii) it shall have military markings, and iii) it shall be commanded by a member of the armed forces and be manned by a crew subject to regular armed forces discipline; see Henderson and Cavanagh (n 40), at p. 198.

54 Norris (n 52), at p. 28.

55 Thommen (n 49), at p. 4.

56 R A Barnes, ‘Article 29’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 241-244, at p. 244.

57 Wegelein (n 47), at p. 133.

58 R A Barnes, ‘Article 32’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 250-253, at p. 253.

vessel employed for a non-commercial activity.⁵⁹ States are free to include in this category any ship, based on the public nature of the service or the activity performed.⁶⁰

The adoption of a flexible and evolutionary interpretation of the UNCLOS, and consequently, the integration of unmanned ships in the category of warship, naval auxiliaries or government ships operated for non-commercial purposes will mainly depend on the practice of the States that is able to give and up-to-date meaning to the dispositions of the UNCLOS. This is particularly relevant, especially considering that being used to perform public functions, unmanned warships, unmanned naval auxiliaries or unmanned government ships used for non-commercial purposes may fall under the scope of Articles 32, 95 and 96 of the UNCLOS and consequently enjoy immunity.

1.2 Unmanned vessels

Neither customary law nor the UNCLOS provides any definition of merchant ships or unmanned merchant ship. Nonetheless, it is understood that merchant ships residually comprise private sea-going vessels and all types of vessels meant to be navigating at sea,⁶¹ which are not warships or government ships operated for non-commercial purposes. This includes oil tankers, cargo ships, fishing vessels, passenger ships, and research vessels not operated by the government. At the current stage of international law, merchant ships are subject to different types of international maritime convention. These conventions cover different areas, prescribe technical requirements, and apply their own definition of vessel or ship. As noted, a detailed analysis of these conventions is not in the scope of this report,⁶² but some may be referred to as an example:

- **MARPOL - The International Convention for the Prevention of Pollution from Ships:** it adopts a very wide definition of ship in order to cover vessels of any type whatsoever operating in the marine environment including ‘hydrofoils boats, air-cushion vehicles, submersibles, floating craft and fixed or float-

59 For more information regarding the criteria for the distinction between public acts and private acts of the foreign State within the doctrine of State immunity, see G M Badr, *State Immunity: An Analytic and Prognostic View (Developments in International Law)*, (Martinus Nijhoff, The Hague, Boston, 1984), at pp. 63-70.

60 Criteria to assess a satisfactory distinction between acts of *jure imperii* and acts of *jure gestiois* relates to the nature of a particular act and not to the object of such act; see Thommen (n 49), at p. 21; and T L McDorman, ‘Sovereign Immune Vessels: Immunities, Responsibilities and Exemptions’ in H Ringbom (ed), *Jurisdiction Over Ships - Post-UNCLOS Developments in the Law of the Sea* (Brill Nijhoff, Leiden, Boston, 2015), 82-102, at p. 89.

61 R Lagoni, ‘Merchant Ships’ in R Wolfrum, *Max Planck Encyclopedia of Public International Law* VI:584, (Oxford University Press).

62 For a detail analysis of the definition of vessel in the main international maritime conventions, see Veal (n 2), at pp.43-128.

ing platforms.⁶³ This broad definition seems to include unmanned ships. Yet, for the convention to apply to a specific unmanned vessel, such an unmanned vessel needs to fit the concrete provisions of the MARPOL annexes.

- **The International Convention on Salvage**: it defines vessel as *'any ship or craft, or any structure capable of navigation'*.⁶⁴ This definition is likely to include unmanned ships that have the capacity to navigate as required.
- **Nairobi Wreck Removal Convention**: it adopts a wide definition of ship as *'a seagoing vessel of any type whatsoever and includes hydrofoils boats, air-cushion vehicles, submersibles, floating craft and floating platforms, except when such platforms are on location engaged in the exploration, exploitation or production of seabed mineral resources'*.⁶⁵ This broad definition is also able to include unmanned ships that are used to navigate on the ocean regardless of their unmanned nature.
- **COLREG - International Regulations for Preventing Collision at Sea**: it defines vessel as *'every description of water craft, including non-displacement craft, WIG craft, and seaplanes, used or capable of being used as means of transportation on water'*.⁶⁶ This definition would exclude from its scope of application small unmanned vessels that are not capable of being used as a means of transportation, but rather employed for other purposes.

63 Article 2(4) of the International Convention for the Prevention of Pollution from Ships (London, 2 November 1973, as amended by the 1987 and 1997 Protocols, in force 19 May 2005); in Portugal, see Government Decree No. 25/87, of 10 July, available at <https://dre.pt/application/file/a/663670>.

64 Article 1(b) of the International Convention on Salvage (London, 28 April 1989, in force 14 July 1996); Portugal is not State Party to this Convention; however, its essential dispositions were incorporated in Decree-Law No. 203/98, of 10 July, available at <https://dre.pt/application/file/a/485100>.

65 Article 1(2) Nairobi Wreck Removal Convention (Nairobi, 18 May 2007, in force 15 April 2015); in Portugal, see Government Decree No. 28/2017, of 25 August, available at <https://dre.pt/application/file/a/108057378>.

66 Article 3(a) Convention on the International Regulation for Preventing Collision at Sea (London, 20 October 1972, in force 15 July 1977); in Portugal, see Government Decree No. 58/78, of 17 June, available at <https://dre.pt/application/file/a/298519>; rectification Statement of 19 July 1978, available at https://dre.pt/web/guest/analise-juridica/-/aj/31550155/init/normal?p_p_auth=KfixU7UQ&AnaliseJuridica_WAR_drefrontofficeportlet_mode=dt.

Section 2:

NATIONALITY AND NAVIGATIONAL RIGHTS

1. Nationality, registration and flagging

As reiterated by the International Tribunal for the Law of the Sea (ITLOS) the '*determination of the criteria and establishment of the procedures for granting and withdrawing nationality to ships are matters within the exclusive jurisdiction of the flag State.*'⁶⁷ This is a well-established rule of general international law codified in Article 91 of the UNCLOS,⁶⁸ which does not, however, provide any guidance on the registration itself.⁶⁹ The UNCLOS merely imposes to the flag State an obligation to create and maintain a registration of vessels flying its flag,⁷⁰ provided that the following two requirements are observed:

- Article 91(1) of the UNCLOS requires a genuine link to exist between the flag State and the registering vessel as a pre-condition for registration. Yet, the (in)validity of the registration cannot be challenged by third States, as noted by ITLOS in '*M/V Saiga*' Case⁷¹ and reaffirmed in the '*M/V Virginia G*' Case.⁷² As a result, a State cannot be internationally liable for granting its flag to a vessel or to an unmanned vessel without complying with the requirement of the genuine link.
- Article 92(1) of the UNCLOS imposes that vessels shall sail under the flag of one State only. Therefore, a State may not grant its nationality to vessels, which have already been granted a flag or a nationality of a third State.⁷³

Provided that these orientations are observed, it is the domestic legislation of the flag State that defines the categories, sub-categories, and classification of ves-

67 See ITLOS '*M/V Saiga Case*' No. 2 (*Saint Vincent and the Grenadines v. Guinea*) Judgment (1999) paras. 63 and 65, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_2/published/C2-J-1_Jul_99.pdf.

68 Article 93 of the UNCLOS also contemplates the possibility that ships may fly the flag of an international organization.

69 Article 11(1) the UN Convention on Conditions for Registration of Ships, adopted on 7 February 1986, UN DOC. No. TD/RS/CONF/23, not yet entered into force, available at https://treaties.un.org/doc/source/docs/TD_RS_CONF_19_Add.1_E.pdf.

70 Article 94(2)(a) UNCLOS.

71 '*M/V Saiga*' Case (n 67), at para. 75-76.

72 ITLOS '*M/V Virginia G*' Case No. 19 (*Panama v. Guinea-Bissau*) Judgment (2014) para. 113, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.19/judgment_published/C19_judgment_140414.pdf.

73 Tanaka (n 15), at p. 160.

sels entitled to be registered into the national registry, as well as the categories of ships owners.⁷⁴ The internal legislation may also facilitate provisional registration for a certain period of time.⁷⁵ Countries such as Panama⁷⁶ and Belize⁷⁷ permit provisional registration of vessels for 6 months with a possibility of extension.

The application of this rule to unmanned vessels means that each State retains the exclusive power to determine, in the first place, the criteria and procedures for granting and withdrawing its nationality to unmanned ships flying its flag.⁷⁸

State practice shows that when organizing national registries, recreational crafts are normally subject to a proper registration⁷⁹ separated from the registration of merchant ships or commercial fishing vessels.⁸⁰ States have also specific provisions requiring the registration of submarines and other submersibles,⁸¹ hovercrafts, off-shore drilling platforms and other mobile devices.⁸² Other countries exempt from registration floating docks.⁸³

Considering that unmanned merchant vessels are technically different from regular vessels, the creation of a specific registration database for unmanned vessels or a clear indication of its nature in the regular system seems to be more appropriate. The registration would include the same information that is required for regular vessels such as type and size (tonnage), the ownership, port of registry, identification number, among others.⁸⁴ In addition, it is recommended that specific and technical

74 R Coles and E Watt, *Ship Registration: Law and Practice*, (2nd ed., Informa London, 2009), at p. 20.

75 For some discussions regarding provisory and permanent registration, see '*M/V Saiga*' Case (n 67), at paras. 60 and 66.

76 Panama legislation enables vessels to enter into a provisional registration for 6 months with a possibility of extension for more 3 months. *Ibid.*, at p. 14.

77 Problems with vessel registration in Belize were addressed by ITLOS in *The 'Grand Prince' Case No. 8 (Belize v France)* Judgement (2001), available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_8/published/C8-J-20_apr_01.pdf.

78 Article 91 UNCLOS.

79 This is the case of Portugal, which approved a specific legal regime for the registration of recreational vessels, provided for in Decree-Law No. 124/2004, of 25 May, available at <https://dre.pt/application/file/a/252121>.

80 Coles and Watt (n 74), at p. 20.

81 See section 2(1) of the New Zealand Ship Registration Act No. 89/1992 reprinted as at 1 March 2017, available at <http://legislation.govt.nz/act/public/1992/0089/latest/DLM275027.html>.

82 See section 1 of the Norwegian International Ship Registration Act No. 48/1987, 12 of June, available at <https://www.sdir.no/contentassets/d99bd3f3f3a748c6a7a198f786e21907/act-of-12-june-1987-no.-48-relating-to-a-norwegian-international-ship-register-nis.pdf?t=1523551108433>.

83 See Section 11/29 of the Denmark Merchant Shipping Act No. 75/2014 of 17 January, available at <https://www.dma.dk/Vaekst/Rammevilkkaar/Legislation/Acts/The%20merchant%20shipping%20act%20%28consolidation%29.pdf>.

84 R Lagoni (n 61), at para. 10.

information arising from the unmanned nature of the craft shall be registered, notably the type of technology employed for navigation, identification of the distance-based master or the operator,⁸⁵ endurance, as well the identification of the crew and the specific training acquired.

2. The legal regime of flagged unmanned vessels

Completed registration at the national level either in central or local records establishes a permanent relationship between the State and the unmanned ship and creates several legal effects both to the unmanned vessels and the registering State. Scholars have contended that the UNCLOS' rules regarding the rights and the duties of the ships and the States shall apply to unmanned ships.⁸⁶

2.1 The rights and the duties of flagged unmanned vessels

Registration at the national level gives the unmanned vessel the right to fly the flag of the registering State, the right to receive the documents to attest such registration,⁸⁷ and the right to enjoy diplomatic protection.

It does not seem to be complex for an unmanned vessel to fly a flag of a State neither to have on board documents attesting its nationality.⁸⁸ However, some difficulties may be identified regarding diplomatic protection.

Rules for diplomatic protection, notably those regarding attribution of nationality are defined by the domestic law of the States, but the process can be scrutinized on an international level, as it was already highlighted by the ICJ in the '*Nottebohm*' Case.⁸⁹ Diplomatic protection of vessels means that only the authorities of the flag State may legally represent the vessel before other States, international organization, courts and tribunals. One can give as an example, Article 292(2) of the UNCLOS regarding prompt release, which clearly say that '*the application for release may be made only by or on behalf of the flag State.*'

85 Operator in this context means the person that is responsible for remotely controlling the unmanned vessel.

86 See Kraska (n 3); A H Henderson, 'Murky Waters: The Legal Status of Unmanned Undersea Vehicles' (2006) 53 *Naval Law Review* 55-72; E V Hooydonk 'The law of unmanned merchant shipping- an exploration' (2014) 20 *The Journal of International Maritime Law*, 403-423.

87 It is up to the municipal legislation to determine the type, the form and the characteristics of such documents; see D Guilfoyle, 'Article 91' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 692-699, p. 699.

88 Although some rules for determining how these documents will be carried out are necessary.

89 See ICJ '*Nottebohm*' Case (*Liechtenstein v Guatemala*) (second phase) Judgment (1955), available at <https://www.icj-cij.org/files/case-related/18/018-19550406-JUD-01-00-EN.pdf>.

As emphasized by ITLOS case law,⁹⁰ diplomatic protection considers the vessel as a unit and as a single entity. Consequently, the diplomatic protection is extended to the cargo, and to other interests in the vessel, to its operations, and to the master and the crew regardless of their nationality.

As far as the unmanned vessel is concerned, one can discuss how does diplomatic protection work in the case of distance or shore-based masters and crew. It can be understood that, for jurisdiction purposes, on board masters and crew are treated as part of the vessel and subject to the diplomatic protection of the flag State. Beyond the labour contractual relationship, the physical presence of the masters and the crew on board of the vessel (in some cases during many months) intrinsically connects them with the vessel.

In the case of unmanned vessels, the physical connection does not exist. Distance-based masters and crew may be able to control the craft from a different country from where the vessel is registered. It seems possible for an unmanned vessel to be flagged in State A, owned by a national of State B, and controlled by a distance-based master national of State C, but living and working in State D.

Does it make sense, from an international law perspective, that in case of unmanned vessels, diplomatic protection of the masters and the crew is provided by the flag State? Or is the physical separation from the vessel enough for the flag State to deny its diplomatic protection?

Until a legal solution is found or a common State practice is carried out, it is important to note that the exclusive jurisdiction of the flag State over vessels flying its flag does not exempt third States to assert jurisdiction over its nationals.⁹¹ As a result, shore-based masters and crew can always be subject to the jurisdiction of the State of nationality.

Registered unmanned vessels are also subject to duties. From the UNCLOS comes the obligation for unmanned vessels to maintain their flag during a voyage or whilst in a port of call. Other than in the case of a change of registry or transfer of ownership,⁹² once registered, unmanned vessels are not permitted to change their flag. In addition, registration at the domestic level places the unmanned vessels under the prescriptive and the enforcement jurisdiction of the flag State, and under the obligation to comply with the requirements imposed by its domestic legislation.

90 See *'M/V Saiga'* Case (n 67), at para.10; and ITLOS *'M/V Virginia G'* Case (n 72) para. 128.

91 See D Guilfoyle, 'Article 92' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017) 700-704, at p. 703.

92 Article 92(1) UNCLOS.

This rule has the following exceptions that shall also be applicable to unmanned vessels:

- In the territorial sea and in the internal waters, unmanned vessels are subject to the territorial sovereignty of the coastal State, its prescriptive and enforcement jurisdiction, and shall abide by all the rules and regulations in force in accordance with Article 21 of the UNCLOS. Non-compliance enables the coastal State to take enforcement actions, ranging from requesting the unmanned vessel to stop a certain conduct, to requiring an immediate withdrawal and even, boarding and expelling the unmanned vessel from the territorial sea.⁹³
- On the high seas and in the exclusive economic zone (EEZ), unmanned vessels may be subject to the jurisdiction of other States rather than the flag State, as a result of specific treaties,⁹⁴ the flag State consent, and in certain circumstances, as a result of the right of visit⁹⁵ and the right of hot pursuit⁹⁶ exercised by a warship from a different State, in accordance with the UNCLOS. In the EEZ, unmanned vessels can also be subject to the jurisdiction of the coastal State when they are involved in activities that may cause pollution and threats to the marine environment, as provided for in Articles 210(3), 220(5) and (6) of the UNCLOS or violate the coastal State rules and regulations regarding the coastal State's sovereignty rights and jurisdiction as provided for in Article 73 of the UNCLOS.

2.2 The jurisdiction of the flag State over unmanned vessels

The flag State is subject to the duties set forth in Article 94 of the UNCLOS.⁹⁷ Paragraph 1 of this Article imposes a general obligation on the flag State to effectively exercise *jurisdiction* and *control* over ships flying its flag in administrative, technical and social matters. Paragraph 2, elaborates such obligations. Despite the location of

93 D R Rothwell and T Stephens, *The International Law of the Sea*, (2nd ed., Hart Publishing, Oxford, and Portland, Oregon, 2016), at p. 233.

94 Several international treaties have been dealing with suppression of certain crimes at sea, proliferation of weapons of mass destruction, fisheries, among others; for more information regarding these treaties, see D Guilfoyle, *Shipping Interdiction and the Law of the Sea*, (Cambridge, Cambridge University Press, 2009).

95 Article 110, UNCLOS.

96 *Ibid.*, Article 111.

97 Article 94 of the UNCLOS only applies to merchant ships; see M Nordquist, N Grandy, S Nandan and S Rosenne (eds), *United Nations Convention on the Law of the Sea 1982: A Commentary* (Vol. III) 'Article 94' (Martinus Nijhoff, The Hague, 1995), at p. 146.

Article 94 in Part VII of the UNCLOS that regulates the high seas,⁹⁸ it is accepted that this Part reflects customary international law, and applies to all vessels regardless of their location and notwithstanding the special duties that the flag State holds on the high seas.⁹⁹ This report argues that this principle shall apply to unmanned vessels.

2.2.1 Jurisdiction over social matters

Jurisdiction over social matters relates to the labour conditions for the manning of ships, including training and qualification of masters, crew and to the exercise of criminal and civil jurisdiction over them.

Article 94(4)(b) of the UNCLOS determines that the flag State shall ensure that *'each ship is in the charge of a master and officers who possess appropriate qualifications, in particular in seamanship, navigation communications and marine engineering, and that the crew is appropriate in qualification and numbers of the type, size, machinery and equipment of the ship.'*

The fact that unmanned vessels are devoid, by their nature, of an on board master and crew does not exempt the flag State to comply with this duty. Nonetheless, it is important to consider that the duties and the tasks of the shore-based masters and crew might have a different scope resulting from the nature and specific features of the unmanned vessel.

Flag State jurisdiction and control over social matters shall be exercised in accordance with the domestic legislation and taking into account the applicable international instruments approved by the International Labour Organization (ILO), and the IMO. Both entities play a key role defining international rules applying to the labour conditions¹⁰⁰ and defining appropriate qualifications for distance-based masters and crew in the areas listed in Article 94(4)(b) of the UNCLOS (such as seamanship and navigation). However, more importantly, are the discussions that shall be carried out in order to impose other technical areas that shall be under the control of distance-based masters and crew.

Exercising effective social control and jurisdiction over unmanned vessels also means that the flag States are entitled to assert criminal and civil jurisdiction over the master and the crew.¹⁰¹ The application of this rule to unmanned vessels is likely

98 *Ibid.*, at p.152.

99 Rothwell and Stephens (n 93), at p. 167.

100 For manned vessels, internationally minimum standards for crew were approved in 1978 by the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, (London, 1 December 1978, in force 1 January 1979) which was amended in 1995 and 2010; in Portugal, see Government Decree No. 28/85, of 8 August, available at <https://dre.pt/application/file/a/180542>.

101 Rothwell and Stephens (n 93), at p. 169.

to raise some challenges because it may be complicated for a flag State to effectively exercise its criminal and civil jurisdiction over masters and crew that are not on board of a vessel but rather based in a third country.

Jurisdiction over social matters also covers on board passengers or any person being transported, even when they are transported illegally.¹⁰² For this reason, Article 98 of the UNCLOS, imposes that flag States shall require the master, the crew or the passengers to render assistance to any person found at sea in danger of being lost and to proceed with all possible speed to the rescue of persons in distress, informed of their need for assistance, provided that this can be done without serious danger to the ship.

How this obligation is going to be abided by the flag States in case of unmanned vessels is still to be seen. It seems that it is possible for a shore-based master or crew to alert authorities in case they found persons in distress at sea, but it is hard to perceive how they are going to effectively render assistance if there are no persons on board. Technology can be developed to enable unmanned vessels to provide assistance, notably by launching other small unmanned surface vessels equipped with first aid kits, goods and water, to give support to those in distress at sea.

Jurisdiction over social matters relates to persons on board. For this reason, the obligation of the flag State to render assistance does not apply in case of distress of unmanned vessels that do not transport persons.¹⁰³

2.2.2 Jurisdiction over administrative and technical matters

Jurisdiction over administrative and technical matters covers the flag State's competence regarding registration and release of all documents required for a certain vessel to legally navigate. This includes documents regarding compliance with international regulations in force for environmental protection and for the safety at sea.

As occurs with vessels, technical regulations for unmanned vessels shall be discussed, prepared and agreed internationally, in order to be generally accepted, as Article 94(5) of the UNCLOS suggests. This requirement does not necessarily impose the approval of such rules by a formal treaty, neither requests universal agreement.¹⁰⁴

102 D Guilfoyle, 'Article 94' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 707-714, p. 711.

103 L Carey, 'All hands-off deck? The legal barriers to autonomous ships' *CML Working Paper Series* 17/06, 2017/ 011, available at <https://law.nus.edu.sg/cml/pdfs/wps/CML-WPS-1706.pdf>; at p. 20.

104 Report of the International Law Commission (ILC) to the General Assembly, UN GAOR Supp (N 9) UN Doc. A/3159 (1956) II Yearbook of the International Law Commission 'Article 34 Commentary' para. 4, p. 281, available at http://legal.un.org/ilc/publications/yearbooks/english/ilc_1956_v2.pdf. These generally accepted rules shall not be confused with customary international law. For a rule of customary international law to ex-

Yet, it does exclude from this category procedures and practices only adopted by a few States. Well-established regional rules, as those prepared within the scope of the EU and provided for in the Best Practice Guide for Unmanned Maritime Systems Handling, Operations, Design and Regulations adopted within the SARUMS group¹⁰⁵ may be accepted. But this is not free of discussion.

It shall be mentioned that, in December 2017, the IMO General Assembly adopted the Strategic Plan for the Organization and it has pointed out, new advancing technologies as an area of particular focus, for the period 2018-2023. In the list of the outputs for the biennium 2018-2019, is the preparation of a regulatory scoping exercise for the use of maritime autonomous surface ships.¹⁰⁶

2.3 Jurisdiction of the coastal State

The coastal State is also entitled to exercise in the territorial sea limited criminal and civil jurisdiction over foreign ships. No reasons seem to be valid to exclude the same jurisdiction over unmanned vessels.

Consequently, the coastal States are entitled to exercise criminal jurisdiction over unmanned vessels navigating on its territorial sea if one of the links set forth in Article 27 of the UNCLOS applies. The list of situations provided for in such norm is mainly focused on matters happening on board of the craft rather than its external conduct.¹⁰⁷ If this is the case, coastal States are entitled to apply criminal enforcement measures against the unmanned vessel, including the arrest of persons. Nonetheless, in practice, it will extremely complicate for the authorities of the coastal State to arrest a suspect of a crime committed using an unmanned vessel. It may not only be hard to locate the country where the suspect is based but also arresting persons in the territory of a third State raises several questions.

A Coastal State's civil jurisdiction¹⁰⁸ in relation to acts committed on board of foreign vessels is regulated in Article 28 of UNCLOS. Paragraph 1 exclusively relates

ist a proof of two elements is required: a general and consistent practice adopted by States (*usus*) and the conviction that such practice is mandatory (*opinion juris*); see A Cassese, *International Law*, (2nd Ed., Oxford University Press, USA, 2005), at p. 156.

105 SARUMS, *Best Practice Guide document* (n 9) was prepared by a technical work group from different Member States of the EU and under its responsibility and sponsored by the European Defense Agency.

106 IMO General Assembly Resolution A.1110(30) of 6 December 2017, *Strategic Plan for the Organization for the Six-Year Period 2018-2023*, available at <http://www.imo.org/en/About/strategy/Documents/A%2030-RES.1110.pdf>.

107 R A Barnes, 'Article 27' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 229-237, at p. 231.

108 For more information on civil jurisdiction see H Yang, *Jurisdiction of the Coastal State over Foreign Merchant Ships in Internal Waters and the Territorial Sea*, (Springer, Berlin, 2006).

to the jurisdiction over persons on board, so it is not, in principle, applicable to unmanned vessels that are devoid of on board master and crew.

The remaining paragraphs of Article 28 of the UNCLOS relate to the jurisdiction over vessels crossing the territorial sea, and may have application to unmanned ships. As a rule, coastal States may not levy execution against or arrest an unmanned vessel for the purpose of exercising civil jurisdiction. Civil jurisdiction can only be asserted against an unmanned vessel as a result of obligations or liabilities incurred during innocent passage through the territorial sea, for instance, in case of collision, salvage and towage.¹⁰⁹

2.4 Exemptions from registration

The UNCLOS does not require all ships to be registered by the flag States. Article 94(2)(a) exempts from national registration those ships that are excluded from generally accepted international regulations on account of their small size¹¹⁰ that, by default, have the nationality of the owner.¹¹¹

The UNCLOS preparatory work shows that the introduction of this exception was aimed at excluding from onerous requirements of registration small local vessels that would normally not sail outside the 'coastal State's waters.'¹¹² Under this rationale, ocean-going vessels regardless of their size would still be subject to mandatory registration.¹¹³

The problem is that the wording of Article 94(2)(a) of the UNCLOS does not make any reference to the maritime zone where these unregistered small vessels would have to sail to be exempt from registration. In addition, systematic location of Article 94 in Part VII of the UNCLOS, supports the idea that the exception of non-registration applies to all maritime areas.

This situation may be transposed to small unmanned vessels, but a word of caution is needed. Exemption from registration of unmanned vessels only applies to those which

109 R A Barnes, 'Article 28' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 237-241, at p. 238.

110 There are some countries, like Australia and the United Kingdom that do not require registration of small vessels; see Article 13 of the Australian Shipping Registration Act, No. 8, 1981 exempting from registration ships less than 24 meters in length, government ships, fishing vessels, and pleasure crafts, available at <https://www.legislation.gov.au/Details/C2016C00957>; fishing vessels are, however, subject to compulsory registration under the Fisheries Management Act, No. 162, 1991, which is available at <https://www.legislation.gov.au/Details/C2017C00363/Download>; see also Article 1 (1)(d) of the 1995 United Kingdom Merchant Shipping Act, which exempts from registration vessels under 24 meters length owned by qualified owners, available at <http://www.legislation.gov.uk/ukpga/1995/21/data.pdf>;

111 R R Churchill and A V Lowe, *The Law of the Sea*, (3rd ed., Manchester University Press, Manchester, 1999), at p. 213.

112 Nordquist 'Article 94'(n 97), at p. 146.

113 Guilfoyle (n 94), at p. 711.

are excluded from generally accepted international rules and standards (GAIRS),¹¹⁴ on account of their small size, and not because such norms have not yet been agreed.

Moreover, it is important to mention that Article 94(2)(a) of the UNCLOS does not impose any obligation of exemption from registration, it rather grants a right to the registering State to waived such onerous act without breaching any international obligation. States can still impose on their domestic law registration of this small vessels and unmanned vessels that are excluded from GAIRS on account of their small size.

3. Rights and freedoms of navigation: legal challenges

Freedom of navigation is one of the most important pillars of the law of the sea and remains essential to maritime commerce and international shipping industry.¹¹⁵ Vessels and ships, as well as submarines traditionally enjoy different rights and freedoms of navigation not only on the high seas¹¹⁶ but also in other maritime zones, such as the EEZ¹¹⁷ and, to some extent, in the territorial sea. The attribution of rights and freedoms of navigation to unmanned vessels in different maritime zones imposes some challenges that will be analyzed further.

3.1 The right of innocent passage in the territorial sea

In the territorial sea, freedom of navigation is ensured by the right of innocent passage,¹¹⁸ provided for in Article 17 of the UNCLOS, which is widely accepted as codifying customary international law.¹¹⁹ The right of innocent passage applies to warships and vessels of all States, whether coastal or land-locked, regardless of the type of vessel, size, means of propulsion cargo, flag, origin, or destination.¹²⁰ The

114 Despite the inconsistency in terms of terminology, several UNCLOS provisions refer to GAIRS; for more information, see B Vukas, 'Generally Accepted International Rules and Standards' in A Soons (ed.), *Implementation of the Law of the Sea Convention through International Institutions* Proceedings of the Law of the Sea Institute 23 (1990), at pp. 405-407.

115 Churchill and Lowe (n 111), at p. 255.

116 Article 87, UNCLOS.

117 *Ibid.*, Article 58.

118 Tanaka (n 15), at p. 86.

119 Rothwell and Stephens (n 93), at p. 230; see also the ICJ '*Military and Paramilitary Activities in and against Nicaragua*' (*Nicaragua v. United States*) Merits Judgment (1986) para 214, available at <https://www.icj-cij.org/files/case-related/70/070-19860627-JUD-01-00-EN.pdf>;

120 For the interpretation of the concept of innocent passage it is worth reading the *Joint Statement on the Uniform Interpretation of Rules of International Law Governing Innocent Passage*, signed in 1989, between the United States of America and Soviet Union; the joint Statement was concluded as a result of a diplomatic incident after an American vessel entered into the Soviet Union's territorial sea without previous authorization; see United Nations Office for Ocean Affairs and the Law of the Sea 'Law of the Sea Bulletin', (No. 14, 2012), at p. 13, available at http://www.un.org/depts/los/doalos_publications/LOSBulletins/bulletinpdf/bulE14.pdf; accessed 17 July 2017.

meaning of ‘*passage*’ includes not only the passage but also stopping and anchoring in so far as such activities are incidental to ordinary navigation or rendered necessary by distress or *force majeure*.¹²¹

The right of innocent passage is a conditional right in the sense that the passage is only innocent as long as it is not prejudicial to the peace, good order or security of the coastal State, and it is undertaken in conformity with the UNCLOS, and other rules of international law.¹²²

Article 19(2) of the UNCLOS sets forth a list of activities that renders a passage non-innocent.¹²³ For instance, launching, land or taking on board any aircraft or any other military device,¹²⁴ such as an UAV, or conduct MSR activities without consent of the coastal States renders the passage non-innocent. The word ‘*activity*’ used in Article 19(2) of the UNCLOS seems to induce the interpretation that what is relevant to the assessment of the passage is the way and the manner the passage is carried out and not the type or other characteristics of the ship itself. This position was defended:

- ***In the ICJ ‘Corfu Channel’ Case:*** in accordance with the tribunal’s view, a breach of the coastal State’s laws and regulations would not *ipso facto* render the passage non-innocent since considerations of the manner in which the passage is undertaken also needs to be assessed;¹²⁵
- ***In the ICJ Case ‘Concerning Passage Through the Great Belt’:*** in Finland’s Memorial it can be read that the ‘*international law has never limited rights of passage through territorial seas and straits to an exclusive category of beneficiaries, whether defined as ships, vessels or otherwise.*’¹²⁶
- ***By Professor Lowe:*** who in the defense of the instrumental nature of the right of innocent passage concludes that ‘*there is no greater reason to limit the scope of the rights to ships of a traditional shape than there is to limit them to craft powered by sail or by galley slaves.*’¹²⁷

121 Article 18(2) UNCLOS.

122 *Ibid.*, Article 19(1).

123 The main question around this list is whether or not the list shall be considered exhaustive or merely illustrative. For more information, see Tanaka (n 15), at p. 87.

124 *Ibid.*, at p. 289.

125 See the ICJ ‘*Corfu Channel*’ Case (*United Kingdom v Albania*) Merits Judgment (1949) at p. 30, available at <https://www.icj-cij.org/files/case-related/1/001-19490409-JUD-01-00-EN.pdf>; see also, Churchill and Lowe (n 111), at p. 83.

126 See ICJ, ‘*Great Belt*’ Case (n 46), at para. 406.

127 Lowe (n 45), at p. 294.

As a result, despite the fact that nothing in the UNCLOS provides for the right of innocent passage to unmanned vessels, there is no objective justification that entitles the coastal State to deny the right of innocent passage to unmanned vessels crossing the territorial sea and complying with all the laws and regulations in force. Requiring a master or a commander as a pre-condition for the exercise of the right of innocent passage would hamper the innocent passage and, consequently, be considered as a breach of the UNCLOS by the coastal State.¹²⁸ This rationale shall apply, in the same terms, to the right of transit passage to unmanned vessels in straits used for international navigation.

3.2 The right of the coastal State to regulate innocent passage

The coastal State is entitled to regulate innocent passage through its territorial sea. However, its prescriptive jurisdiction is limited by several UNCLOS dispositions, particularly, by Article 21(1) that determines the areas that can be subject to the domestic legislation of the coastal State. This includes, for instance, safety of navigation and maritime traffic,¹²⁹ protection of navigational aids and facilities and other facilities or installations.¹³⁰ The precise extent to which coastal States are entitled to adopt safety measures while regulating innocent passage is not detailed in the UNCLOS. Nonetheless, the conjugation of several paragraphs of Article 21(1) of the UNCLOS might legitimate the coastal State to adopt and designate specific routes for unmanned vessels to exercise the right of innocent passage. Alternatively, the coastal State might find legitimacy in Article 22 of the UNCLOS to approve specific sea lanes and traffic separation schemes for the right of innocent passage of unmanned vessels to be exercised.

Laws and regulations regarding innocent passage shall be given due publicity by the coastal State,¹³¹ and shall not be discriminatory or impose general tolls on foreign unmanned vessels by the reason of their passage through the territorial sea, although it may impose charges for specific services rendered.¹³² As a result, unmanned vessel assisted by the coastal State due to mechanical problems may be subject to payment of such services.

In principle, the coastal State is not entitled to regulate design, construction, manning or equipment of foreign vessel, unless they give effect to GAIRS.¹³³ There are

128 Rothwell Stephens (n 93), at p. 236.

129 Article 21(1)(a) UNCLOS.

130 *Ibid.*, Article 21(1)(b).

131 *Ibid.*, Article 21(3).

132 *Ibid.*, Article 26.

133 *Ibid.*, Article 21(2).

some unanswered questions not only regarding the definition of GAIRS themselves but also regarding their adoption and their normative content.¹³⁴ But it seems that the justifications based on which this orientation was adopted shall also be extended to unmanned vessels.

A slightly different situation would be the case where the legislation of the coastal State imposes compulsory pilotage¹³⁵ on vessels transporting hazardous or harmful substances across the territorial sea in order to ensure safety of navigation and to preserve the marine environment. This was so the case of Finland that in 2003 imposed compulsory pilotage to enter into its territorial waters required by the hazardous or harmful nature of the cargo or by the size of the vessel.¹³⁶

Coastal States bordering international straits and archipelagic States are also entitled to regulate transit passage, but their prescriptive jurisdiction is even more limited by the scope of Article 42 the UNCLOS.¹³⁷ Laws and regulations regarding safety of navigation of unmanned vessels and maritime traffic can only be passed in accordance with Article 41 of the UNCLOS and are restricted to the approval of sea lanes and traffic separation schemes that shall conform to generally accepted international regulations.¹³⁸

An analysis of Articles 41 and 42 of the UNCLOS seems to induce the conclusion that, in principle, compulsory pilotage in international straits and in archipelagic sea lanes passage cannot be imposed. This solution is not, however, without controversy, and the compulsory pilotage system requested by Australia in 2006 in Torres Strait is a good example of it. Amendments introduced by the Australian Parliament to the Commonwealth Navigation Act of 1912 imposing a compulsory pilotage system in Torres Straits, after its designation as a Particularly Sensitive Sea Area was subject to several protests by States. Among the arguments raised against compulsory pilotage system was the idea that such a requirement may impeding, delay, impairing or hampering the exercise of transit passage, which is prohibited by the UNCLOS.¹³⁹

134 For more clarifications see RA Barnes, 'Article 21' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 199-208, at p. 207.

135 Pilots are persons with local knowledge that do not belong to the ship but are used to provide support to the master when the master is not familiar with the area. For more information see IMO webpage, available at <http://www.imo.org/en/OurWork/Safety/Navigation/Pages/Pilotage.aspx>.

136 See Finland Pilotage Act No. 940/2003, as amended by 998/2015, Unofficial Translation available at <http://www.finlex.fi/en/laki/kaannokset/2003/en20030940.pdf>.

137 See Article 52, UNCLOS.

138 *Ibid.*, Article 41(3).

139 See D K Anton, 'Making or Breaking the International Law of Transit Passage? Meeting Environmental and Safety Challenges in the Torres Straits with Compulsory Pilotage' in D D Caron and N Oral (eds), *Navigating Straits* (Brill Nijhoff, Leiden, Boston, 2014), 49-86, at p. 54.

3.3 The entrance of unmanned vessels into internal waters and ports

Over internal waters, the coastal State exercises full sovereignty in the same terms as it does in relation to its land territory.¹⁴⁰ As a result, there is no right of innocent passage in internal waters, and it is entirely up to the coastal State to determine the rules for foreign vessels and foreign unmanned vessels to enter into internal waters and to access its ports,¹⁴¹ which are an integrated part of coastal States territory.¹⁴²

Having full territorial sovereignty over this matter, the coastal State has full prescriptive jurisdiction and may fix whatever conditions it may regard as necessary for unmanned vessels to access its ports, such as:

- It can nominate the ports, which are open to unmanned vessels;
- It can impose certain conditions for the entrance of unmanned vessels, including regarding safety and security;
- It can refuse the entrance of unmanned vessels into its ports, even in the event of being in distress,¹⁴³ provided that such refusal is not discriminatory and does not constitute abuse of right as required by Article 300 of the UNCLOS;
- It can impose mandatory pilotage or even remote pilotage for unmanned vessels to enter the ports.¹⁴⁴

Non-compliance with the legislation in force legitimates the coastal State to adopt enforcement actions and impose punitive measures¹⁴⁵ such as fines, as well as seizure and arrest of unmanned vessels involved in the conduct.

140 B Marten, *Port State Jurisdiction and the Regulation of International Merchant Shipping*, (Springer, Hamburg, 2013), at pp. 16-25.

141 Churchill and Lowe (n 111), at p. 62.

142 F L Bastos, 'O porto e o direito internacional do mar' in M J da Costa Gomes (coord) *IV Jornadas de Lisboa de Direito Marítimo, o Porto*, (Almedina, Lisboa 2018) 663-685, at p. 670.

143 See Churchill and Lowe (n 111), at p. 63; Tanaka (n 15), at p. 84; K Trümpler, 'Article 8' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 84-96, at p. 95; *Ibid.*, Bastos, at p. 679.

144 This has been suggested by Roll-Royce AAWA 'Remote and Autonomous Ships- the next steps' (Position Paper, Rolls-Royce, 2016), available at <https://www.rolls-royce.com/~media/Files/R/Rolls-Royce/documents/customers/marine/ship-intel/aawa-whitepaper-210616.pdf>.

145 For more information regarding the difference between enforcement measures of a punitive character and those that merely withhold benefits, see E J Molenaar, 'Port State Jurisdiction: Toward Comprehensive, Mandatory and Global Coverage' (2007) *38 Ocean Development and International Law*, 225-257, at p. 229.

3.4 Freedom of navigation of unmanned vessels in the EEZ and on the high seas

Freedom of navigation on the high seas is listed in Article 87 of UNCLOS along with other freedoms of the high seas,¹⁴⁶ and applies to the EEZ in so far as its exercise is not incompatible with the dispositions of the UNCLOS regarding EEZ and the rights of the coastal State.¹⁴⁷

In principle, in the EEZ, the coastal State cannot impose burdens to the navigation of unmanned vessels based on the fact they are unmanned and impose, for instance, mandatory pilotage. Nevertheless, this freedom of navigation of unmanned vessels in the EEZ shall be balanced with the sovereignty, jurisdiction and rights of the coastal State in accordance with Article 56(1) of the UNCLOS. Therefore, while sailing in the EEZ, unmanned vessels shall be equipped with sensors and appropriate technology to be able to navigate without colliding or damaging artificial islands, installations and structures, as well as with other floating devices used for MSR. The same rational applies to the activities of unmanned vessels and their obligation to respect submarine cables and pipelines being laid in the EEZ in accordance with Article 58(1) of the UNCLOS. Hence, what is important here is not a matter of law but a matter of fact. Unmanned vessels are subject to the same obligations of regular vessels regarding navigation.

The use of unmanned vessels to conduct military activities in the EEZ of third States is not free of discussion.¹⁴⁸ The UNCLOS does not address this issue, but during its negotiations, military activities were regarded as being part of freedom of the high seas and included in the concept of internationally lawful uses of the sea.¹⁴⁹ In accordance with this traditional position, an unmanned vessel shall be entitled to conduct military missions in the EEZ of a third State provided that it respects the principle of peaceful uses of the ocean,¹⁵⁰ it refrains from unlawful conducts, it has due regard to the rights of other users of the sea, and it complies with the other rules of international law.

146 Such as freedom of navigation, freedom of overflight, freedom to lay submarine cables and pipelines, freedom to construct artificial islands and other installations, freedom of fishing, freedom of scientific research.

147 Article 58(2) UNCLOS.

148 For more information on the military uses of the EEZ, see P A Dutton, 'The International Dynamics of the Controversy Over Military Activities in the EEZ' in J V Dyke, S Broder, S Lee, and J Paik (eds), *Governing Ocean Resources New Challenges and Emerging Regimes A Tribute to Judge Choon-Ho Park* (Martinus Nijhoff Publishers, Leiden, 2013), at pp. 287-306; M Hayashi, 'Military Activities in the Exclusive Economic Zone of Foreign Coastal States, in D Freestone (ed), *The 1982 Law of the Sea Convention at 30: Successes Challenges and New Agendas* (Martinus Nijhoff Publishers, Leiden, 2013) 121-129; and J Geng, 'The Legality of Foreign Military Activities in the Exclusive Economic Zone under UNCLOS' (2019) 28(74) *Utrecht Journal of International and European Law*, at pp. 22-30.

149 Nordquist 'Article 88' (n 97), at p. 91; see also the UN Charter (San Francisco, 26 June 1945, in force 24 October 1945), available at <https://treaties.un.org/doc/source/docs/charter-all-lang.pdf#page=23>.

150 Article 301, UNCLOS.

Nevertheless, some States¹⁵¹ do not permit the exercise of military activities within their EEZ, and have demonstrated their position on declarations made when accessing the UNCLOS.¹⁵² Declarations of such countries do not specifically mention the nature of the vessel from where the military activities are carried out. It is then possible that they interpreted their declarations as including all military activities conducted in the EEZ regardless of the manned or the unmanned nature of craft where the activities are conducted from.

This practice, along with other restrictions that some coastal States impose on their EEZ to protect their living resources and the security of coastal populations, and even to control marine pollution, may suggest that a new norm of customary international law is emerging '*that allows coastal States to regulate navigation through their EEZ based on the nature of the ship and its cargo.*'¹⁵³ However, this position is still being developed and more State practice is necessary to justified a new rule of customary international law.

On the high seas, unmanned vessels shall exercise their freedom of navigation in good faith,¹⁵⁴ with the due regard for the interest of other States¹⁵⁵ and with respect to activities in the Area.¹⁵⁶ The main challenges that navigation of unmanned vessels on high seas would bring relates to the application of the international regulations aimed at preventing collision at sea codified in the COLREGS.¹⁵⁷

151 Such as India, Brazil, Malaysia, Pakistan, Cape Verde, among others.

152 Article 310, UNCLOS.

153 For information on State practice regarding the regulation of navigation through EEZ, see J M V Dike, 'The disappearing right to navigational freedom in the exclusive economic zone' (2005) 29 *Marine Policy*, at pp. 107-121.

154 Article 300, UNCLOS.

155 *Ibid.*, Article 87(2).

156 *Ibid.*, Article 147(3).

157 COLREG (n 66); see, Veal (n 2), at pp- 62-72.

Chapter 3

UMVs UNDER THE UNCLOS

Section 1

GENERAL CONSIDERATIONS

As it has already been mentioned, this report endorses the idea that the UNCLOS, as the '*constitution for the oceans*' shall regulate the deployment and use of UMVs in the marine environment. However, since UMVs are a recent reality that the UNCLOS does not directly regulate as such, the construction of a potential legal regime that shall apply to UMVs, will mainly depend on the legal regime that is applicable to the activity where they are used. UMVs developed by *MarInfo Project* are mostly employed in MSR projects and are also available to support law enforcement activities. Consequently, this report is focused on the analysis of the legal regime that regulates UMVs used for MSR activities as well as the legal regime that applies to UMVs used in the right of hot pursuit. Nevertheless, it is firstly important to provide some clarifications regarding the potential rights and freedoms of navigations of UMVs since the question may have practical importance for Portugal as a coastal State.

1. Rights and freedoms of navigation of UUVs in different maritime areas: legal challenges

Nothing in the UNCLOS provides for the right of innocent passage to UUVs through the territorial sea of third States. Yet, from the UNCLOS text some guidance can be found that is likely to support the construction of a possible legal regime of innocent passage of UUVs.

When it comes to USVs, it can be argued that those which have the endurance and the capacity to cross the territorial sea of a third State, would be entitled to the right of innocent passage. As it has already been defended, it is not the feature and the characteristics of the craft crossing the territorial sea that seem to be relevant to assess the right of innocent passage, but rather how the passage is carried out. As long as the USVs comply with laws and regulations of the coastal State regarding innocent passage¹⁵⁸ and do not carry out any activity identified in Article 19(2), which is considered prejudicial to the peace, good order and security of the coastal State, USVs shall be entitled to the right of innocent passage.

The right of innocent passage of UUVs that operate underwater can be legally defended based on Article 20 of UNCLOS, which besides including submarines also mentions '*other underwater vehicles*.' This expression may accommodate different types of vehicles, including UUVs, which shall enjoy the right of innocent passage as long as they navigate on the surface and show their flag. This position is defended by Barnes, who supports the idea that independent underwater crafts, where UUVs may be included, which are not tethered to a mother ship¹⁵⁹ and have the capacity to navigate in the ocean are subject to innocent passage under Article 20 of the UNCLOS.¹⁶⁰ The legislation of the coastal State can waive the requirement for commercial UUVs to navigate on the surface.

In straits used for international navigation or in archipelagic sea lanes approved by the archipelagic States, UUVs are entitled to exercise their navigational rights in normal mode, which is navigating submerged.¹⁶¹

In the EEZ and on the high seas, UUVs in general are subject to the freedom of the high seas listed in Article 87 of UNCLOS in similar terms as earlier mention regarding unmanned vessels. Still, it is important to reinforce that the freedom of

¹⁵⁸ Article 21, UNCLOS.

¹⁵⁹ If tethered to a vessel submersible crafts will follow the legal regime applicable to that vessel.

¹⁶⁰ R A Barnes, '*Article 20*' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017) 196-199, at p. 198.

¹⁶¹ For the United States of America understanding of normal mode, see Norris (n 52), at p. 38.

navigation of UMVs in the EEZ shall be balanced with the sovereign rights and the jurisdiction of the coastal State.¹⁶² Therefore, the use of UMVs for any of the following activities is subject to the internal legislation of the coastal State:

- Exploration and exploitation of natural resources, whether living or non-living of the waters superjacent to the sea-bed, and of sea-bed and its subsoil, including production of energy from the water, current and winds;
- Establishment and use of artificial islands, installations and structures;
- MSR activities;
- Protection and preservation of the marine environment.

2. UMVs potential references in the UNCLOS

Throughout the UNCLOS different terminology is used that could potentially integrate UMVs on its scope. Beyond the terms ‘vessel’ and ‘ship’, general terms such as ‘structures’, ‘platforms’, ‘artificial islands’, ‘installations’, and ‘equipment’ are referred to.

- Structures are mentioned in the following Articles of UNCLOS: 1(5)(a)(i), 56(1)(b)(i), 60(1)(b), 79(4), 80, 207(1), 208(1), 209(2), 214, 246(5)(c). It seems that the term is used not as a technical concept, but rather to refer to its general definition as constructions or object constructed from several parts, which can be placed in the marine environment;
- Platforms are only mentioned in Article 1(5)(a)(b), UNCLOS as a potential source of marine pollution;
- Artificial Islands are referred to in the following Articles of the UNCLOS: 60, 79(4), 80, 87(1)(d), 208(1), 214, 246(5)(c), and refer to islands that are not naturally formed but rather man-made constructions;
- Installations are mentioned in the following Articles of the UNCLOS: 7(4), 11, 19(2)(k), 47(4), 56(1)(b)(i), 60, 79(4), 80, 87(1)(d), 94(7), 109(2),(3)(b), 111(2), 129, 145(a), 147(2), 153(5), 194(3)(c)(d), 208(1), 209(2), 214, 246(5)(c), 249(1)(g), 258, 259-262. Installations are man-made structures located with some permanence in the marine environment;

¹⁶² Articles 58(3) and 59, UNCLOS.

- Equipment is included in the following Articles of the UNCLOS: 1(5)(b)(i), 21(2), 62(4)(a), 94(3)(a), 94(4)(a), 129, 194(3)(c)(d), 202(a)(iii), 211(6)(c), 217(2), 226(1)(a)(i), 248(b), 249(1)(g), 274(b), 275(2). Equipment is understood as a device or instrument of quick deployment and removal normally not fixed or anchored to the ocean floor.

Considering the definition of UMV given for the purpose of this report as ‘*an untethered, self-propelled and self-powered vehicle with the capacity of movement without a human presence on board*,’¹⁶³ it seems that UMVs can be classified as equipment. This is mainly due to the fact that equipment not being moored or fixed to the ocean floor has the capacity of movement, while structures, platforms, artificial islands and installations although not necessarily fixed, are placed in the marine environment with some stability and for long periods of time.

The UNCLOS provides a legal framework, laid down in Section IV Part XIII, which applies to both scientific installations and scientific equipment used for MSR purposes. This report provides an analysis this legal framework, which can also be used as a starting point for future discussions on the legal regime of UMVs used for other purposes.

Section 2

APPLICABILITY OF PART XIII TO UMVs

1. The legal regime of UMVs

1.1 Compulsory registration

Compulsory registration of equipment used for MSR is a controversial issue. Article 262 of the UNCLOS does not impose that they shall be compulsorily registered, but it prescribes that equipment placed in the marine environment for MSR shall bear identification markings for the purpose of identifying the State of registry or the international organization to which they belong.¹⁶⁴ Despite the use of the term ‘*shall*’ it

¹⁶³ See chapter 1 of this report.

¹⁶⁴ Registration of equipment and installations was also a controversial issue during the discussions of the Draft Convention on the Legal Status of Ocean Data Acquisition Systems, Aids and Devices prepared in 1972 but never adopted. See, Draft Convention on the Legal Status of Ocean Data Acquisition Systems, Aids and Devices, (2nd revision Intergovernmental Oceanographic Commission of the United Nations Educational Scientific and Cultural Organization 1993); see also N Papadakis, ‘Some Legal Problems Associated with the Ocean Data Acquisition Systems, Aids and Devices (ODAS)’ (1975) 5(1) *International Relations* 825-837, at pp. 825, 833.

is uncertain to ascertain that there is a clear obligation imposed on States to have a national registry of equipment.¹⁶⁵ Moreover, the absence of a uniform State practice regarding such registration, it makes it hard to classify the registration as a compulsory requirement.¹⁶⁶ Nevertheless, as highlighted by Soons,¹⁶⁷ registration is very important, particularly when it comes to unmanned installations and equipment, and consequently, to UMs.

From an international law perspective, the registration of UMs is mainly justified based on the obstacles arising from the absence of registration:

- In the territorial sea, the absence of identification markings does not enable the coastal State to confirm the identity of the device;
- In case of an accident at sea, such as collision, the absence of registry may create additional constraints regarding the identification of the liable State or international organization. Rules regarding the liability of marine causality claim the identification of the registered owner;
- In practice, absence of registration may seriously hamper the effective enforcement of Article 196 of the UNCLOS, which can be invoked in case of marine pollution caused by emerging technologies, such as UMV.¹⁶⁸ Although Part XIII of UNCLOS lacks dispositions regarding MSR-based pollution, Article 196 of UNCLOS imposes on States the obligation to take all measures to prevent, reduce and control pollution resulting from the use of technologies under their jurisdiction or control, regardless of their geographical location.¹⁶⁹ As a result, Article 196 of the UNCLOS would make the State of registry responsible not only for any pollution leaked from a UMV but also for its recovery in case of failure, loss or damage caused to the marine environment.¹⁷⁰ If no registration is made, the liable State cannot be identified.

165 See I Papanicolopulu, 'Article 262' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1746-1749, at p.1748.

166 *Ibid.*, at p. 1748.

167 A Soons, *Marine Scientific Research and the Law of the Sea*, (Deventer, Kluwer, 1982), at p. 237.

168 See D Czybulka, 'Article 196' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1319- 1328, at p.1321.

169 M Nordquist, N Grandy, S Rosenne, A Yankow (eds), *United Nations Convention on the Law of the Sea 1982: A Commentary* (Vol. IV), 'Article 196' (Martinus Nijhoff, The Hague, 1995), at p. 76.

170 For additional information on the impact of MSR on the marine environment, see A M Hubert, 'The New Paradox in Marine Scientific Research: Regulating the Potential Environmental Impacts of Conducting Ocean Science' (2011), *Ocean Development & International Law* (42), at pp. 329-355.

The UNCLOS does not provide conditions for the registration of UUVs, particularly imposing a genuine link as it requires for vessels. Therefore, each State or international organization is free to establish and organize its registration as it wants,¹⁷¹ and impose whatever conditions it considers adequate for the registration of UUVs. Besides, States are free to create a national registry imposing national registration of all UUVs being deployed in the marine environment not only for MSR purposes but also for other purposes, including private ones.

From the rationale of Article 262 of the UNCLOS, completed by its Articles 240(c) (d), 261 and 263, it is possible to deduce a set of general principles that should guide the use of small UUVs in other operations than MSR. Hence, it seems important for the States to consider, when preparing national regulations, that the national registration systems may include all types of UUVs.

1.2 Compulsory use of warning signals

Article 262 of the UNCLOS imposes the obligation of UUVs to have adequate internationally agreed warning signals to ensure safety at sea and safety of air navigation. Warning signals have to take into account GAIRS established by the IMO and the International Civil Aviation Organization. As highlighted by the IMO Resolution No. 671(16) on Safety Zones and Safety of Navigation Around Offshore Installations and Structures,¹⁷² warning signal may include, among others lights, sound signals, racons and means for permanent visual out-look and radar watch, listening for and warning vessel on VHF channel 16 or other appropriate radio frequencies. The IMO Resolution No. A.50(III), which approves the recommendations of the Maritime Safety Committee on the marking of oceanographic stations¹⁷³ is also a good example of GAIRS, which distinguishes between different types of warning signals to be used depending on the concrete features of the oceanographic stations.

As far as it is known, the IMO has not yet discussed the approval of any resolution or even guidelines establishing warning signals for UUVs used in the marine environment. This report defends that approval of warning signals for UUVs shall be prepared as a matter of urgency. UUVs may have different sizes, colors and forms; they may operate both on the surface and underwater in different maritime zones,

¹⁷¹ Soons (n 167), at p. 237.

¹⁷² See preamble of the IMO Assembly Resolution No. 671(16), *Safety Zones and Safety of Navigation Around Offshore Installations and Structures*, (19 October 1989), Annex 1(1), available at http://www.imo.org/blast/blastDataHelper.asp?data_id=22502&filename=A671.pdf.

¹⁷³ IMO Assembly Resolution A.50 (III) *On Marking of Oceanographic Stations*, (18 October 1963), available at [http://www.imo.org/blast/blastDataHelper.asp?data_id=29182&filename=A50\(III\).pdf](http://www.imo.org/blast/blastDataHelper.asp?data_id=29182&filename=A50(III).pdf).

and depending on the maritime area they operate, some UMVs may be subject to maritime traffic and congestion. As a result, adoption of internationally approved warning signals would bring several advantages, such as:

- Facilitate the identification of UMVs among other similar devices, notably buoys and free-floating instruments launched from vessels;
- Promote safety of navigation and collision avoidance, especially considering the small size of some UMVs;
- Prevent UMVs to unjustifiably interfere with other legitimate uses of the sea as compatible with the UNCLOS, namely fishing, and avoid damages to and from fishing gears.

1.3 Legal status

UMVs used in the marine environment even those placed with some character of permanence remain as a man-made construction and are not naturally formed areas.¹⁷⁴ For this reason, UMVs do not have the statute of islands, have no territorial sea or generate any other maritime zone, and their presence does not affect the delimitation of maritime boundaries, as clarified by Article 259 of the UNCLOS.

2. Deployment and use of UMVs in different maritime areas

Deployment and use of any type of UMVs in the marine environment by States or competent international organizations, is subject to the same legal regime established for MSR, as set for in Article 258 of the UNCLOS. While regulating MSR within Part XIII, the UNCLOS adopts a zonal approach and determines specific conditions for MSR to be carried out in the territorial sea, in the EEZ, on the continental shelf, in the water column beyond the EEZ (high seas) and in the Area.

2.1 In the territorial sea

In the territorial sea, UMVs can only be deployed and used with the express consent and under the conditions set forth by the coastal State, which has sovereignty and the exclusive right to regulate and authorize the deployment of any MSR equipment.¹⁷⁵

¹⁷⁴ More information regarding the difference between natural formed areas and man-made ones, see Wegelein (n 47), at p. 136.

¹⁷⁵ Article 245 UNCLOS.

The express consent of the coastal State is also mandatory in situations where the UMV is not deployed but rather drift into the territorial sea from other maritime zones or is launched by an aircraft.

Coastal States are free to adopt legislation setting out the conditions for MSR to be carried out, including regarding restrictions on research methods, notably UUVs. In addition, when authorizing on a case-by-case basis, a specific MSR project¹⁷⁶ coastal States are entitled to impose additional requirements or, exceptionally, do not impose certain restrictions required by their regulations.¹⁷⁷ An authorization for deployment and use of UUVs in a certain project by a certain entity does not necessarily mean that other UUVs in a different project will be awarded the same authorization.

The express consent for the deployment and use of UUVs within a MSR project is always required, even when legislation regarding MSR has not been passed. The only exception to this rule is when legislation expressly waiving the express consent is in force.¹⁷⁸

A word of caution is needed regarding launching of UUVs for MSR from ships crossing the territorial sea under the regime of innocent passage. As enshrined in Article 19(2)(j) of the UNCLOS, carrying out research activities in the territorial sea from a ship in innocent passage renders the passage non innocent.¹⁷⁹

UUVs acting in contravention to the laws and regulations in force legitimate the coastal State, within the UNCLOS framework and in accordance with the general principles of international law, to request UUVs to leave the territorial sea,¹⁸⁰ and even to seize the UUVs if such measure is necessary and proportional to stop the unlawful conduct.

2.2 In the EEZ and on the continental shelf

In the EEZ and on the continental shelf, UUVs can only be deployed and used with the consent of the coastal State,¹⁸¹ which in the exercise of its jurisdiction and in accordance with the relevant provisions of the UNCLOS,¹⁸² is entitled to conduct, regulate and authorize MSR.

176 Articles 245 and 21(g) UNCLOS.

177 Wegelein (n 47), at p. 180.

178 *Ibid.*, at p. 181.

179 *Ibid.*

180 Rothwell and Stephens (n 93), at p. 233.

181 Article 246(2) UNCLOS

182 *Ibid.*, Article 246(1).

This regime applies to all UUVs conducting MSR in the EEZ regardless of the maritime area from where they were launched. Hence, UUVs deployed on the high seas but collecting oceans data in the EEZ or on the continental shelf of a coastal State, are subject to the legal regime provided for in Article 246 of the UNCLOS.

It can be argued that the rationale is the same for MSR conducted in the EEZ but from the atmosphere through UAVs. The UNCLOS does not regulate scientific research undertaken from the atmosphere. However, Soons argued that there is no reason to exclude the application of the UNCLOS if the scientific data is collected from the ocean.¹⁸³ What is relevant for the UNCLOS to apply is the collection of information and data from the EEZ, and not the location of the equipment employed for that purpose. In accordance with this point of view, the use of UAV from the airspace above the EEZ for MSR in the superjacent waters is covered by the UNCLOS regime,¹⁸⁴ and it is subject to the consent of the coastal State.¹⁸⁵

The legal regime for the deployment of UUVs in the EEZ and on the continental shelf provided for in the UNCLOS is more complex since it entails clarifications regarding the concept of ‘pure’ and ‘applied’ research as well as some insights regarding the regime of consent of the coastal State.

2.2.1. The difference between ‘pure’ and ‘applied’ research

The UNCLOS dedicates the entire Part XIII to MSR; but an authoritative definition is not provided. During the UNCLOS negotiations, inconclusive discussions were held in order to define MSR but the lack of consensus moved the negotiators to abandon the adoption of a legal definition of MSR.¹⁸⁶ Scholars have contributed to defining MSR as ‘*study and experimental work designated to increase human knowledge of the marine environment*’.¹⁸⁷ This definition covers any scientific investigation conducted in the water column, on the seabed and the subsoil, and in the atmosphere immediately above the sea having the marine environment as object.¹⁸⁸ In 2014, the ICJ ‘*Whaling in the Antarctic*’ Case¹⁸⁹ considered, for the first time, the meaning of MSR

183 Soons (n 167), at p. 124.

184 *Ibid.*, at p. 177; and S Huh, K Nishimoto, ‘Article 246’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1649-1664, at p.1658.

185 Wegelein (n 47), at p. 203.

186 Soons, (n 167), at p. 122.

187 Wegelein (n 47), at p. 12.

188 Soons (n 167), at p. 124.

189 ICJ ‘*Whaling in the Antarctic*’ Case (*Australia v. Japan; New Zealand intervening*) Judgement (2014), available at <https://www.icj-cij.org/files/case-related/148/148-20140331-JUD-01-00-EN.pdf>.

within the context of the International Convention for the Regulations of Whaling.¹⁹⁰ However, it did not provide a general definition of scientific research but rather limited its analysis to the meaning of the phrase '*for the purpose of scientific research*.'¹⁹¹

The definition of MSR is relevant mainly because the UNCLOS establishes different legal solutions for '*pure*' and '*applied*' MSR projects.

Pure research is the research that is strictly and exclusively conducted for peaceful purposes and aimed at increasing the scientific knowledge of the marine environment as a whole for the benefit of mankind. It is research that is not driven by any economic gain but rather by the determination to contribute to a better understanding of the marine environment, which serves the humanity as a whole.¹⁹² This is the research clearly mentioned in Article 246(3) of the UNCLOS.

Applied research is also conducted exclusively for peaceful purposes. However, the purpose of the research is to collect data regarding natural living and non-living resources with direct significance for the exploration and exploitation of such resources. Applied research is the research that is motivated by economic interest arising from the exploitation of marine natural resources¹⁹³ and for the benefit of some individuals or corporations. This type of research is mentioned in Articles 246(5)(a) and 249(2) of the UNCLOS.

The distinction between pure and applied research is relevant within areas under national sovereignty or jurisdiction because the legal regime for MSR and, consequently, for the deployment and use of UMVs, varies in accordance with the type and the purpose of the research carried out. Differently, on the high seas there is no distinction between pure and applied research and in the Area the distinction seems to be blurred, since the UNCLOS does not regulate applied research in the Area.

2.2.2 Compulsory and optional consent

Deployment and use of UMVs in the EEZ and on the continental shelf is subject to the consent of the coastal State. However, Article 246(3) of the UNCLOS limits the discretionary power of the coastal State and imposes compulsory consent if cumulatively:

190 International Convention for the Regulations of Whaling (Washington, 2 December 1946, in force 10 November 1948); Portugal is not a State Party to this convention.

191 ICJ *Whaling in the Antarctic* (n 190), paras. 86-87.

192 See Ribeiro, *A Proteção da Biodiversidade* (n 36), at p. 751.

193 Soons (n 167), at p. 125.

- i) ‘*normal circumstances*’ apply:¹⁹⁴ the UNCLOS does not define what normal circumstances are but clarifies that they may exist in spite of the absence of diplomatic relations between the coastal State and the deploying State. This seems to induce that the evaluation of the existence of normal or abnormal circumstances is more related to the relationship between the coastal State and the deploying State rather than with any other situations, such as the devices employed in the research;¹⁹⁵
- ii) The UMV shall be used in MSR projects carried out exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of mankind. This reflects the idea that the coastal State, in principle, should not stop other researching States from conducting MSR that is to be used for the benefit of all.

What can be further discussed is whether or not the coastal State may approve a MSR project but impose restrictions on the use of UUVs based on the grounds that they are not an appropriate method of research.

Article 240(b) of UNCLOS, while establishing the general principles for the conduct of MSR, determines that MSR shall be carried out with appropriate scientific methods. No specific prohibitions on means or methods of research are imposed, which would permit the use of any equipment, including UUVs, which do not result in the violation of the rights of the States set for in the UNCLOS.¹⁹⁶ It can be argued that, in normal circumstances, coastal States may not refuse consent to the use of UUVs for the purpose of collecting information on the marine environment in pure MSR projects.

The coastal State’s consent is optional and may be withheld when UUVs are employed in applied MSR projects, which are those of direct significance for the exploration and exploitation of natural resources, as provided for in Article 246(5)(a), UNCLOS. Consequently, if the UUV is to be used for any kind of research regarding exploration and exploitation of natural resources, coastal States are not obliged to grant consent and have the discretionary power to withhold it.

Optional consent of the coastal State to authorize the deployment and use of UUVs in the EEZ and on the continental shelf also applies in the following situations listed in Article 246(5) paragraphs b), c) and d):

194 It is not in the scope of this report to analyse the use of autonomous vessels in the deployment and use of UUVs for MSR purposes.

195 Huh and Nishimoto ‘Article 246’ (n 184), at p. 1659.

196 See N Matz-Lück, ‘Article 240’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017) 1617-1624, at p. 1621.

- When UMVs are involved in some kind of drilling into the continental shelf, in the use of explosives or in the introduction of harmful substances into the marine environment;
- When UMVs are engaged in the construction, operation or use of artificial islands, installations, and structures mentioned in Article 60 of the UNCLOS;
- When UMVs are used by States that have outstanding obligations to the coastal State from a prior research project, even if this prior project did not employ any UMV.

In any circumstance, the use of UMVs shall not unjustifiably interfere with activities undertaken by coastal States in the exercise of their sovereign rights and jurisdiction provided for in the UNCLOS.¹⁹⁷

Once the consent is lawfully refused, the requesting State shall comply with such decision. There is no legal mechanism that enables the requesting State to use international adjudication, notably the ICJ or ITLOS or even an arbitral tribunal to force the coastal State to grant consent, because the exercise by the coastal State of its right or discretion under Article 246 of the UNCLOS is not subject to compulsory dispute mechanisms provided for in Part VX of UNCLOS.¹⁹⁸

2.2.3 Presumed and implied consent

The deployment of UMVs in the EEZ or on the continental shelf of a third State cannot be done without its consent. Nevertheless, in accordance with the UNCLOS, there are two situations where the consent of the State is presumed or implied.

Presumed consent is provided for in Article 247 of the UNCLOS for MSR projects carry out within the context of international organization and enables the use of UMVs without express consent in the following situations:

- UMVs deployed and used by an international organization in the EEZ or on the continental shelf of a member State or in a State to which the international organization has a bilateral agreement, shall be deemed to have been authorized, if the deployment and use of UMVs is carried out within a MSR project dully approved by the coastal State within the framework of the international organization;

¹⁹⁷ Article 246(8), UNLOS.

¹⁹⁸ *Ibid.*, Article 297(2)(a)(i).

- ii) Presumed consent of the coastal State for deployment and use of UUVs in its EEZ and on the continental shelf also applies when the coastal State is willing to participate in the project and has not expressed any objections within four months of its notification by the organization.

From Article 247 of the UNCLOS it does not necessarily follow that the deployment and use of UUVs shall be made by the international organization itself. Few international organizations would have the capacity to undertake MSR projects,¹⁹⁹ and consequently, to use UUVs. Thus, it is argued that the regime of presumed consent for the deployment of UUVs applies to States members of the organization.²⁰⁰

Implied consent is provided for in Article 252 of the UNCLOS and applies to deployment and use of UUVs either by States or international organizations that have not received any authorization from the coastal State. The consent is considered implied six months after the date upon which the documentation of the project has been submitted, and the State has not given the express consent and remains silent within four months after the submission of the application.

2.3 In the extended continental shelf beyond 200 nautical miles

Coastal States are entitled to extend their continental shelf beyond 200 nautical miles provided that the requirements and the procedure established by Article 76 of the UNCLOS are observed. The process of extension is very detailed, complex and based on scientific evidence presented by the States and it raises several legal and technical questions.

For the purpose of this report, what is important to clarify is that the legal regime that regulates the deployment and use of UUVs in the extended continental shelf is the same that applies to the continental shelf, even when the process of extension is ongoing and is not yet completed. The rights of the coastal States over the continental shelf, whether extended or not, do not need to be claimed or used, since they exist *ipso facto and ab initio* as a natural prolongation of their land territory, as firstly emphasized in the 1969 ICJ ‘*North Sea Continental Shelf*’ Cases,²⁰¹

199 The Intergovernmental Oceanographic Commission of the United Nations Educational Scientific and Cultural Organization is probably the organization that plays the most significant role regarding MSR; see E Franckx, ‘Article 247’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1664-1672, at p. 1670.

200 *Ibid.*, at p. 1666.

201 ICJ ‘*North Sea Continental Shelf*’ Cases (*Federal Republic of Germany v Denmark, Federal Republic of Germany v Netherlands*) Merits Judgement (1969) paras. 19, 39, available at <https://www.icj-cij.org/files/case-related/51/051-19690220-JUD-01-00-EN.pdf>.

and more recently confirmed in the 2012 ITLOS '*Bangladesh Myanmar*' Case.²⁰² This means that even before the limits of the extended shelf are final and binding upon recommendations of the Commission on the Limits of the Continental Shelf (CLSC), deployment and use of UUVs for collecting MSR information is subject to the legal regime established in Article 246 of the UNCLOS, notably regarding legal regime of consent, already explained. The only difference that is worth mentioning refers to the deployment and use of UUVs on the continental shelf for resource-oriented research. In these cases, as imposed by Article 246(6) of the UNCLOS coastal States can only refuse consent when UUVs are used in MSR projects, carried out in accordance with UNCLOS Part XIII to collect information in specific areas where the coastal State may, at any time, publicly designate as areas in which exploitation or detailed exploratory operations will occur within a reasonable period of time. UUVs employed in applied research in the extended continental shelf areas beyond those designated areas are subject to the consent of coastal State that shall, in normal circumstances, be granted.

The coastal State does maintain its entire discretion in designating such areas and, in this way, exercising some control in the use of UUVs for MSR purposes on the extended continental shelf. Moreover, the power to designate such areas is excluded from the compulsory dispute settlement procedures under Part XV of the UNCLOS.²⁰³ Therefore, in case of conflict between the coastal State and the deploying State, the sovereignty rights of the coastal State prevail.²⁰⁴

2.4 In the water column beyond the EEZ (high seas)

Article 257 of the UNCLOS determines that all States irrespective of their location and competent international organizations have the right, in accordance with the UNCLOS, to conduct MSR in the water column beyond the limits of the EEZ, which corresponds to the high seas. Freedom to conduct MSR is also listed in 87(1)(f) of the UNCLOS as one of the high seas freedoms. In accordance with these provisions, UUVs can be freely used for MSR conducted on the high seas and not subject to any consent.

Yet, UUVs launched from the water column but collecting MSR information from the extended continental shelf are not subject to Article 257 of the UNCLOS

202 ITLOS '*Dispute concerning delimitation of the maritime boundary between Bangladesh and Myanmar in the Bay of Bengal*' Case No. 16 (*Bangladesh v Myanmar*) Judgement (2012) para. 409, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_16/published/C16-J-14_mar_12.pdf.

203 Article 297(2)(b) UNCLOS.

204 M G-Ysern, *An International Legal Regime for Marine Scientific Research*, (Transnational Publishers, 2003), at pp. 314.

but rather to Article 246(2) and (6) of the UNCLOS, which requires the consent of coastal States, as previously explained. As early argued in this report in similar circumstances, it seems that it is not the place where the UMV is deployed but rather the location where the MSR data is collected from and the location where the UMV effectively operates that is relevant to determine its legal regime.

2.5 In the Area

2.5.1. Freedom of deployment and use

The establishment of the Area and the legal regime of its mineral resources were codified in the UNCLOS as a common heritage of mankind.²⁰⁵ Based on this idea, Article 143 of the UNCLOS determines that MSR in the Area shall be carried out exclusively for peaceful purposes and for the benefit of mankind as a whole in accordance with Part XIII. This provision seems to induce the idea that in the Area only pure MSR projects can be admitted.

Freedom to conduct MSR in the Area, in accordance with provisions of the UNCLOS Part XI, is provided for in Article 256 of UNCLOS and it also derives from its Article 87(1)(f). This legal regime is understood as customary international law,²⁰⁶ so all States, even those which are not Party to the UNCLOS, are free to undertake activities of MSR in the Area, including deployment and use of UMTs for MSR purposes.

As previously argued, what matters for determining the legal regime of UMTs is the maritime area on which they operate. However, in the case of the Area and the high seas this question is of a little importance since the legal regime applicable is the same:²⁰⁷ UMTs can be freely used, but the deploying States shall have the due regard for the interests of other States, and not unjustifiably interfere with other legitimate uses of the sea.²⁰⁸

205 Articles 1(1) and 136, UNCLOS; for more information on the concept of common heritage see, and F L Bastos, 'Setting the field for future mineral rushes: some reflections on the international regime for the exploration and exploitation of marine minerals' in M C Ribeiro (coord), *30 Years after the Signature of the United Nations Convention on the Law of the Sea: The Protection of the Environment and the Future of the Law of the Sea* (Coimbra Editora, 2014), 119-146, at p. 134.

206 S Huh, K Nishimoto, 'Article 256' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1717-1724, at p. 1721.

207 Churchill and Lowe (n 111) at p. 407; Soons (n 167), at p. 227.

208 Article 240(c) UNCLOS.

2.5.2 The ISA's competence to regulate deployment of UUVs in the Area

The International Seabed Authority (ISA) is an organization without legal personality created by the UNCLOS, comprising all State Parties to the UNCLOS,²⁰⁹ and with exclusive jurisdiction to control and organize activities in the Area, including administering its resources.²¹⁰

The UNCLOS does not directly confer any explicit powers to the ISA to regulate deployment and use of UUVs in the Area for MSR purposes, but its competence may exist if the use of UUVs²¹¹ falls into the scope of the '*activities in the Area*.'

Activities in the Area under the auspices of the ISA refers solely to the exploration and exploitation of mineral resources,²¹² excluding living resource.²¹³ The UNCLOS does not define exploration or exploitation of mineral resources, but the Seabed Dispute Chamber of ITLOS on its advisory opinion on the '*Responsibilities and Obligations of States Sponsoring Persons and Entities with Respect to Activities in the Area*' has significantly contributed to clarify this concept. Two important consequences regarding the legal framework of UUVs in the Area can be argued from the advisory opinion:

- The utilization of UUVs for recovery of minerals from the seabed and their lifting to the water surface, including drilling, dredging, coring, and excavation, disposal, dumping and discharge into the marine environment of sediment, wastes or other effluents, and the use of UUVs for construction and operation or maintenance of installations, pipelines and other devices is subject to ISA mandate.²¹⁴ Processing and transporting is, however, excluded;²¹⁵
- UUVs used for collecting marine information under an applied MSR project concerning mineral resources fall into the concept of exploration and consequently, are under the ISA auspices and subject to its regulations.²¹⁶

209 *Ibid.*, Article 156(2).

210 *Ibid.*, Article 157(1).

211 See S Vöneky and F Beck, 'Article 143' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, München, 2017), 989-100, at p.1997.

212 Article 1(1)(3) and 133(a) UNCLOS.

213 Living resources in the Area are not regulated within the UNCLOS framework; this is the reason that moved the UN General Assembly to decide to develop an international legally binding instrument under the UNCLOS on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction; see the UN General Assembly Resolution 69/292 of 19 June 2015, available at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/69/292&Lang=E.

214 ITLOS, Advisory Opinion (n 26), at para. 94.

215 *Ibid.*, paras. 87 and 96.

216 D Leary, *International Law and the Genetic Resources of the Deep Sea*, (Martinus Nijhoff, Leiden/Boston, 2007), at pp. 50.

Approvals issued by the ISA to the use of UUVs in the exploration of mineral resources in the Area are non-exclusive, so many UUVs may be authorized to undertake MSR in the Area at the same time for different projects.

As noted, ‘*Activities in the Area*’ do not include living resources. Consequently, if the use of a UUV is undertaken in a MSR project regarding living resources, the ISA has no authority to regulate or to grant authorization for its use. This is particularly significant in the case of bioprospecting, which despite its practical commercial purposes, is not under ISA supervision. As a result, bioprospecting benefits from the freedom of the high seas.²¹⁷

The jurisdiction of the ISA is spatially limited to the seabed and its subsoil beyond the limits of national jurisdiction and shall not affect the legal status of the superjacent waters, or the airspace above.²¹⁸ For this reason, UAVs flying the airspace above the Area are not subject to the ISA authority, even when collecting information on the water column, which is free as clearly established by Article 257 of the UNCLOS.

As it can be concluded, the ISA has a very limited mandate when it comes to authorizing the deployment and use of UUVs in the Area for the purpose of MSR. The deploying State is fully responsible for any environmental damage caused by the deployment and use of UUVs in the Area, namely in the hydrothermal vent ecosystems and cold coral reefs or sponges aggregation.²¹⁹ When collecting information on mineral resources in the Area deploying States are obliged to ensure, in accordance with the precautionary principle,²²⁰ that UUVs’ activities do not harm the marine environment, including its living resources. States deploying and using UUVs in the Area are then subject to compel with a due diligence obligation²²¹ in order to prevent or at least mitigate their harmful effect on the marine environment.

217 S Huh, K Nishimoto, ‘Article 257’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1725-1731, at p. 1722; a different position was early defended by some authors and countries; for more information, see J Mossop, ‘Marine Bioprospecting’, in D R Rothwell, A G O Elferink, K N Scoot, T Stephens (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, the United Kingdom, 2015), 825-842, at pp. 836-837.

218 Article 135, UNCLOS.

219 Leary (n 216), at p. 189.

220 H Davies, ‘The Regulation of Marine Scientific Research: Addressing Challenges, Advancing Knowledge’ in R Warner and S Kaye (eds), *Routledge Handbook of Maritime Regulation and Enforcement* (Routledge, London and New York, 2016) 212-230, at p. 220.

221 Permanent Court of Arbitration (PCA) Case No. 2013/19 *In the Matter of China Sea Arbitration (The Philippines v. China)* Award (2015), available at <https://www.pcacases.com/pcadocs/PH-CN%20-%2020160712%20-%20Award.pdf>; see also and C A Gomes ‘Por mares nunca de antes navegados: gestão do risco e investigação científica no meio marinho’ in M C Ribeiro (coord), *30 Years after the Signature of the United Nations Convention on the Law of the Sea: The Protection of the Environment and the Future of the Law of the Sea* (Coimbra Editora, 2014), 331-353, at p. 336.

Section 3

THE RIGHT OF HOT PURSUIT

1. The definition of the ‘right of hot pursuit’

The right of hot pursuit exceptionally entitles coastal States, within certain conditions, to enforce their laws and regulations against foreign vessels sailing on the high seas and suspected of having broken their national laws.²²²

As an exceptional right that limits the freedom of navigation, the right of hot pursuit is an important tool to enable coastal States to effectively enforce their laws and to ‘prevent foreign ships that have violated the laws and regulations of a coastal State from evading responsibility by fleeing to the high seas.’²²³

The traditional configuration of the doctrine of the right of hot pursuit was codified in the 1958 Geneva Convention on the High Seas and has essentially remained the same. The doctrine was subject to some expansion in the UNCLOS in order to include violations of laws and regulations of the coastal State within the EEZ and continental shelf operated by Article 111(2) of the UNCLOS.

In the upcoming years, an increase use of the right of hot pursuit by coastal States it is expected, as a result of the development of an array of advancing technologies that may facilitate better patrolling of maritime waters.²²⁴

The contemporary right of hot pursuit carried out with the support of advancing technologies, such as radars, sensors, sophisticated electronic equipment and UMs, may require new reinterpretations of the requirements imposed by the UNCLOS and an introduction of new State practices in this regard.²²⁵ Willingness to adopt a more liberal approach has been defended.²²⁶ *‘It seems inevitable and desirable that the conditions for the exercise of the right of hot pursuit be given a flexible interpreta-*

222 D Guilfoyle, ‘Article 111’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 772-779, at p. 774.

223 PCA Case No. 2014/02 *Artic Sunrise Arbitration (Netherlands v. Russia)* Award on the Merits (2015) para. 245, available at <https://www.pcacases.com/web/sendAttach/1438>, at para. 245.

224 C H Allen, ‘Doctrine of hot pursuit: A functional interpretation adaptable to emerging maritime law enforcement technologies and practices’ (1989) 20, *Ocean Development & International Law*, 309-341, at p. 310.

225 *Ibid.*

226 See W C Gilmore, ‘Hot pursuit and constructive presence in Canadian law enforcement’ (1988) 12(2) *Marine Policy* 105-11; *Arctic Sunrise Arbitration* (n 223), at paras. 259.

tion, in order to permit the effective exercise of police powers on the high seas,’²²⁷ and to enable technology developments, including the use of UMVs to facilitate the work of the law enforcement agents.

2. Requirements for the exercise of hot pursuit carry out by UMVs

Hot pursuit can only be conducted by warships or military aircrafts or other ships or aircrafts such as naval, coast guard, customs inspection ships, fisheries inspections vessels, police patrol boats, military submarines, which are clearly marked and identified as being on government service and authorized to that effect.²²⁸

As it has been argued elsewhere in this report, an evolutionary interpretation of the UNCLOS facilitates and supports the use of unmanned State vessels and State-owned UMVs dully marked and identified as being on government service. In the same token, they shall also be entitled to carry out hot pursuit, provided that the procedural requirements imposed by Article 111 of the UNCLOS are observed. As noted by ITLOS in ‘*M/V Saiga*’ Case, the conditions set out in Article 111 of the UNCLOS are cumulative so all of them shall be satisfied for the pursuit to be legitimate under the UNCLOS.²²⁹

2.1 Commencement of the pursuit: violation of laws and regulations of the coastal State and the use of UMVs for ascertaining the offending vessel’s position

As established by Article 111(1) of the UNCLOS, the hot pursuit of foreign ship may only occur when competent authorities of the coastal State have good reasons to believe that the foreign ship has violated laws and regulations of the coastal State. The UNCLOS does not clarify what ‘*good reasons to believe*’ are, neither enumerates offenses that may justify the commencement of the pursuit. Accordingly, identifying the character of the alleged unlawful conduct is very important. As noted by ITLOS in ‘*M/V Saiga*’ Case, the information that could raise ‘*no more than a suspicion*’ is not enough for commencing the pursuit.²³⁰ The assessment of the ‘*good reasons to believe*’ shall be made before the arrestment of the ship, and not after it.²³¹ It seems that is not a simple suspicion that may justify and suffices for the right of hot pursuit to be legally

227 Churchill and Lowe (n 111), at p. 216.

228 Article 111(5) UNCLOS.

229 ‘*M/V Saiga*’ Case (n 67), at para. 146.

230 ‘*M/V Saiga*’ Case (n 67), at para. 147.

231 Ibid., Separate Opinion of Judge Anderson, p. 6, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_2/published/C2-J-1_Jul_99-SO_A.pdf.

exercised, but rather a qualify doubt of a serious offense that determines an intrusion on the vessel's freedom of navigation.²³² Otherwise the State is required to compensate for any loss or damage caused as it is imposed by Article 111(8) of the UNCLOS.

Violations of any law and regulation within areas where the coastal State has sovereignty, notably internal waters, territorial sea or archipelagic waters, may justify the right of hot pursuit. In the contiguous zone, pursuit may only be undertaken if there has been a violation of the coastal State's customs, fiscal, immigration or sanitary laws.²³³ In the coastal State's EEZ and on the continental shelf, including in the safety zones around continental shelf installations, the pursuit may only be used in cases where '*violation of the laws which the coastal State is entitled to make in respect of the zone or shelf has occurred*.'²³⁴ This also applies in the extended continental shelf beyond 200 nautical miles.²³⁵

It is up to the coastal State to assess and determine not only the violation of its laws and regulations but also the position where the offending ship commits the offence.²³⁶

While preparing the draft that was later approved as the 1958 Geneva Convention on the High Seas, the ILC proposal for article 47(3) suggested that the position of the offending vessel should be determined by specific methods. The proposal was not adopted neither in the Geneva Convention on the High Seas nor in the UNCLOS. Instead, Article 111(4) of the UNCLOS requires that the pursuing ship may use practicable means that are available for this task. Therefore, it is up to the commander of the enforcing vessel to choose the appropriate means to determine the offending vessel's position, including the use of modern technology, such as UMs and UAVs.

2.2 Visual and auditory signals to stop

As laid down in Article 111(4) of the UNCLOS, pursuit cannot commence before a clear visual or auditory signal to stop has been given to the foreign vessel or its boats. The UNCLOS clearly imposes that the visual or auditory signals to stop shall be given at a distance that enables the signal to be seen or heard by the offending ship. This requirement is aimed at ensuring that the offending ship is aware that it has been required to stop in order to be boarded and inspected, despite the fact that the UNCLOS imposes no requirement on the evidence proving that the offending ship

232 Allen (n 224), at p. 320.

233 Articles 33 and 111(1) UNCLOS.

234 Churchill and Lowe (n 111), at p. 215.

235 See Allen (n 224), at p. 315; see also Nordquist 'Article 111' (n 98), at p. 258.

236 See Yearbook 'Article 47 Commentary' (n 104), at p. 261.

has effectively received the visual or auditory signal.²³⁷ It shall be noted that the use of force to obligate a vessel to stop is not regulated within the UNCLOS provisions but rather by customary international law. ITLOS has defended that the use of force must be avoided as far as possible and must never go beyond what is reasonable and necessary considering the circumstances.²³⁸

In order to prevent abuses, the ILC has clearly recommended that the word ‘*visual or auditory signal shall exclude signals given at great distance and transmitted by wireless.*’²³⁹ As a result of this approach the pursuing ship must be in the vicinity of the offending ship, in order to be able to observe the violation of the coastal State’s laws and regulations. This rule also applies to aircrafts involved in hot pursuit, which are not allowed to give wireless signals. This report defends the adoption of a more liberal approach, in order to accept, for instance, orders given by radio, or using other types of communications.²⁴⁰ In ‘*M/V Saiga*’ Case, ITLOS did not directly address the possibility of signals given by radio, but more recently, the Permanent Court of Arbitration (PCA) in the *Arctic Sunrise Arbitration* accepted that. As noted by the Tribunal, ‘*the parameters of the right of hot pursuit must be interpreted in the light of their object and purpose, having regard to the modern use of technology.*’²⁴¹ This was the case of Australia’s hot pursuit of two fishing vessels, one from Togo and another from Russia, both suspected of illegal fishing in the Australian EEZ, which were given signals to stop by radio. Neither Togo nor Russia protested the emission of the signal to stop by radio.²⁴²

As noted by the PCA ‘*given the large areas that must now be policed by coastal States and the availability of more reliable technology (seabed sensors, satellite surveillance, over-the-horizon radar, unmanned aerial vehicles), it would not make sense to limit valid orders to stop to those given by an enforcement crafts within the proximity required for an audio or visual signal that makes no use of radio communications.*’²⁴³

Advances in maritime communications verified over the recent years and after the codification of the institute of hot pursuit, have rendered the requirements that

237 C T Coombs, *The Doctrine of Hot Pursuit under International Law*, Ph.D. Thesis, (University of Western Australia, Faculty of Law, 2016), at p. 148.

238 See ‘*M/V Saiga*’ Case (n 67), at para. 155-156.

239 Yearbook ‘*Article 47 Commentary*’ (n 105), at p. 285.

240 Churchill and Lowe (n 111), at p. 216.

241 *Arctic Sunrise Arbitration* (n 223) at para. 259.

242 R Baird, ‘Illegal, Unreported and Unregulated Fishing: An Analysis of the Legal, Economic and Historical Factors Relevant to Its Development and Persistence’ *Melbourne Journal of International Law* (2004) 5, 229-334, at p. 328.

243 *Arctic Sunrise Arbitration* (n 223), at para. 260.

signals can only be given by visual or auditory means outdated. Modern means of communication including the use of radio and satellite and other advanced technologies such as UUVs and UAVs may facilitate the delivery of auditory and visual signals. UUVs and UAVs equipped with cameras and sensors may be, through different frequencies, technically capable, to transmit information, including signal to stop that is capable of being received and understood by the offending ship. Signals from the International Code of Signals approved in 1969 and revised in 2003 may be adopted.²⁴⁴

2.3 UUVs ensuring continuity of the pursuit

Once the visual or auditory signals to stop have been released, the pursuit must be hot and initiated immediately. Some flexibility regarding the initiation of the pursuit may be defended that do not put at stake the pursuit's legitimacy.²⁴⁵ State practice shows that the arresting ship does not necessarily need to be the same one which began the pursuit. ITLOS case law in the '*Volga*' Case,²⁴⁶ also confirms that the hot pursuit may be transferred between different ships,²⁴⁷ and between ships and aircrafts, provided they comply with the principles governing the exercise of hot pursuit.²⁴⁸

Immediately after its initiation, the hot pursuit must be continuous and cannot be interrupted. This ensures that enforcement actions are taken against the correct vessel and not against a third innocent vessel that was mistakenly targeted.²⁴⁹

Should the pursuit be interrupted or abandoned the right of hot pursuit shall cease. However, Stephens defends and the State practice confirms²⁵⁰ that short interruptions of the pursuit, especially those imposed by natural causes, like bad water conditions,²⁵¹ darkness, horizon distance shall be admitted provided that the pursuing ship is able to identify the perpetrator vessel.

244 See the International Code of Signals adopted by the Fourth Assembly of the Intergovernmental Maritime Consultative Organization in 1965 and revised in 2003, available at <http://www.seasources.net/PDF/PUB102.pdf>.

245 See Guilfoyle '*Article 111*' (n 222), at p. 776.

246 See ITLOS *The 'Volga' Case No. 11 (Russia Federation v. Australia)* '*Statement in Response of Australia*' (7 December 2002), available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_11/state-ment_response_australia_e.pdf.

247 E J Molenaar, '*Multilateral Hot Pursuit and Illegal Fishing in the Southern Ocean: The Pursuits of the Varsa I and South Tomi*' (2004) 19 *International Journal of Marine and Coastal Law*, at pp.19-42.

248 Yearbook '*Article 47 Commentary*' (n 104), at p. 285.

249 See Allen (n 224), at p. 319.

250 *Ibid.*, at p. 324.

251 T Stephens, '*Enforcing Australian Fisheries Laws: Testing the Limits of Hot Pursuit in Domestic and International Law*' (2004) 15 *Public Law Review*, at pp. 12-16.

Scholars do not agree on whether contact by radar suffices to ensure this requirement. But some countries, such as the United States of America²⁵² take the position that the pursuit is still continuous if the contact is kept by radar. Australia goes even further. Recent amendments introduced in the Fisheries Management Act not only permit law enforcement agents to take photos and video records but also to use any electronic equipment reasonably necessary to collect evidence at sea.²⁵³ This approach seems to have support in the UNCLOS text because Article 111(1) only requires that the pursuit shall not be interrupted.

Objectively, the UNCLOS does not limit the use of new remote means of technology, including radio, radar, satellite or sonar,²⁵⁴ to support the exercise of hot pursuit. As a result, this report defends that UMs may be employed to ensure the continuity of the pursuit, and that hot pursuit may be transferred between ships and UMs and UAV. As long as these devices are able to maintain visual or technological contact with the vessel, so chances of pursuing the wrong vessels are eliminated,²⁵⁵ there are no reasons to exclude them.

2.4 The constructive presence and the use of UMs

In customary international law, the doctrine of constructive presence²⁵⁶ enables the coastal States to arrest foreign ships, which lie outside the territorial sea, but use their boats or contact vessels to commit offences within the territorial sea. Under this doctrine laid down in Article 111(4) of the UNCLOS,²⁵⁷ the right of hot pursuit can be used not only to pursue small boats and contact vessels committing offenses within coastal State's jurisdiction but also to pursue a mother ship that is hovering outside the coastal State waters.²⁵⁸

The doctrine of constructive presence shall apply to justify the liability of a mother ship based on an offence committed by a UMV launched to the territorial sea of third States. Small UMs launched from a mother ship that remains outside the coastal State waters shall be integrated within the scope of Article 111(4), of the

252 See Allen (n 224), at p. 320.

253 See Articles 85E, 85F of the Australia Fisheries Management Act 1991, available at <https://www.legislation.gov.au/Details/C2017C00363/Download>.

254 Rothwell and Stephens (n 93), at p. 450.

255 Allen (n 224), at p. 318.

256 Churchill and Lowe (n 111), at pp. 133, 215.

257 *Arctic Sunrise Arbitration* (n 2234), at para. 253.

258 Rothwell and Stephens (n 93), at p. 455; see also ITLOS *The 'Arctic Sunrise' Case No. 22 (Kingdom of the Netherlands v Russian Federation)*, Dissenting Opinion of Judge Golitsyn, at para. 35, https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.22/published/C22_Golitsyn_221113.pdf.

UNCLOS and be used for the hot pursuit to be launched. Under the extensive view of the doctrine of constructive presence, UMs do not necessarily need to be launched from the mother ship and can also come out from the shore to a mother ship on the high seas, since in this case both are considered to be working as a team.²⁵⁹

²⁵⁹ Churchill and Lowe (n 111), at p. 215.

Chapter 4

SETTLEMENT OF DISPUTES OVER UNMANNED VESSELS AND UMMVs UNDER THE UNCLOS

1. The dispute settlement procedures

The UNCLOS has significantly contributed to the development of settlement of international disputes by adopting different dispute-settlement procedures and a comprehensive institutional framework. Besides the creation of ITLOS, a permanent court with jurisdiction to entertain disputes regarding the application and interpretation of the UNCLOS, the ICJ, and arbitral tribunals can also be called upon to solve disputes involving the interpretation or the application of the UNCLOS.²⁶⁰

Part XV of the UNCLOS establishes a sophisticated regime that applies not only to disputes concerning the UNCLOS but also concerning other agreements that seek to implement the UNCLOS, such as the 1995 Fish Stock Agreement,²⁶¹ or future agreements aimed at implementing the UNCLOS, such as the upcoming internation-

²⁶⁰ Article 287(1) UNCLOS.

²⁶¹ The United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (New York, 4 August, 1995, in force 11 December 2011); in Portugal, see Decree No. 3/2001, of 26 January, available at <https://dre.pt/application/file/a/313478>.

al legally-binding instrument on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction.²⁶²

Overall, settlement of disputes in the UNCLOS provides a wide degree of flexibility to the Parties²⁶³ and is mainly based on three principles:

- **Peaceful resolution of disputes:** disputes arising between States shall be settled by peaceful means, in accordance with Article 279 of the UNCLOS that reinforces the obligation of the States, enshrined in Article 2 of the UN Charter, to settle their disputes by peaceful means avoiding the use of force,²⁶⁴
- **Flexible regime of dispute resolution mechanism:** as long as the dispute is settled by peaceful means, States are free to choose the procedures to do it²⁶⁵ as laid down in Article 280 of the UNCLOS;
- **Compulsory dispute resolution mechanism:** in accordance with Article 281 of the UNCLOS, the procedures provided for in Part XV shall only apply where no settlement has been reached by States on their own.

Parties to a dispute under the UNCLOS may also be parties to other general, regional or bilateral agreements that also provide alternative means for the binding settlement of disputes. If this is the case, those procedures will apply in lieu of Part XV of the UNCLOS,²⁶⁶ unless parties otherwise agree, as noted by Article 282 of the UNCLOS.

Another procedural limitation on jurisdiction under Section 2 of Part XV is set forth in Articles 283 and 286 of the UNCLOS. Parties in a dispute concerning the interpretation or the application of the UNCLOS, are under a preliminary obligation to exchange views in good faith²⁶⁷ through negotiation or other peaceful means. This obligation applies to any agreement between the parties for settlement of the dispute even if they do not entail binding decisions.²⁶⁸

262 See the UN General Assembly Resolution 69/292 of 19 June 2015, available at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/69/292&Lang=E.

263 N Klein, *Dispute Settlement in the UN Convention on the Law of the Sea*, (Cambridge University Press, Cambridge, 2004), at pp. 29.

264 See A Serdy, 'Article 278' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1813- 1817, p. 1816.

265 See B Oxman, 'Courts and Tribunals: The ICJ, ITLOS, and Arbitral Tribunals', in D R Rothwell, A G O Elferink, K N Scoot, T Stephens (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, the United Kingdom, 2015), 394-415, at p. 401.

266 Rothwell and Stephens (n 93), at p. 480.

267 Article 300, UNCLOS.

268 See Oxman (n 265), at p. 402.

Before triggering the compulsory mechanisms, the UNCLOS also gives the option for a voluntary conciliation established under Article 284 of the UNCLOS to be organized. Conciliation proceeds before a conciliation commission that examines the facts and the law, and drafts a non-binding proposal to settle the dispute.²⁶⁹

When disputes cannot be settled by recourse to negotiations or other peaceful means, States may use compulsory procedures entailing binding decisions regulated in Part XV Section 2 of the UNCLOS. The court or the tribunal having jurisdiction under Section 2 of Part XV of the UNCLOS is empowered to render an award that is legally binding on both parties involved,²⁷⁰ even when one of the parties do not participate in the proceedings.²⁷¹

2. Disputes over unmanned vessels and UUVs

Dispute settlement mechanisms laid down in Part XV of the UNCLOS only apply to disputes regarding the interpretation or the application of the UNCLOS.²⁷²

The term ‘dispute’ shall be understood in its ordinary meaning and comprises any disagreement over a law or a fact²⁷³ to be determined objectively by the courts. Interpretation is aimed at determining the meaning and the scope of a specific rule, while application refers to the consequences of certain rules to a specific case or situation. For the purpose of this report it is important to discuss whether or not disputes arising or connected to the use of unmanned vessels and UUVs may be submitted to the dispute settlement mechanism under Part XV of the UNCLOS.

Unmanned vessels and UUVs are not specifically mentioned, neither specifically regulated within the UNCLOS. Yet, they are deployed and use in the marine environment and potential conflicts arising will be mostly connected with the rights and obligations of the States under the UNCLOS, notably their navigational rights. Accordingly, this report argues that future disputes over unmanned vessels and UUVs

269 See A Serdy, ‘Article 284’ in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1838-1841 p. 1841.

270 Article 296(1), Article 33, Annex VI, Article 11 Annex VII, Article 4 Annex VIII, UNCLOS.

271 See ITLOS *The ‘Arctic Sunrise’ Case No. 22 (Kingdom of the Netherlands v Russian Federation)* Order, (2013) paras. 46, 57, available https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.22/published/C22_Order_221113.pdf; see also *Ibid.*, Joint Separate Opinion of Judge Wolfrum and Judge Kelly para. 5-16, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.22/published/C22_Wolfrum_Kelly_221113.pdf.

272 Articles 279, 280, 281, 282, UNCLOS.

273 ITLOS, *‘Southern Tuna’ Cases No 3 and 4 (New Zealand v. Japan; Australia v. Japan)* Provisional Measures (1999) para 44, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_3_4/published/C34-O-27_aug_99.pdf.

will be subject to Part XV of the UNCLOS. This position is supported by the UNCLOS preamble where negotiators demonstrated their motivation to open the UNCLOS to future developments,²⁷⁴ including issues regarding settlement of disputes involving areas to be developed over time.

2.1 Disputes concerning unmanned State vessels

Dispute concerning unmanned State vessels can be subject to the dispute settlement procedures established under the UNCLOS, unless Article 298(1)(b) of the UNCLOS applies.

Article 298(1)(b) of the UNCLOS determines that States by written declaration, are entitled to exempt themselves from the compulsory procedures regarding *'disputes concerning military activities, including military activities by government vessels and aircrafts engaged in non-commercial service, and disputes concerning law enforcement activities in regard to the exercise of sovereign rights or jurisdiction excluded from the jurisdiction of a court or tribunal under article 297, paragraph 2 or 3.'*²⁷⁵ States lodging declarations under this Article can only be subject to the procedure provided for in the UNCLOS upon an express consent,²⁷⁶ or if the declaration is withdrawn.²⁷⁷ As noted by ITLOS in *'MV Louisa'* Case, when *'parties have made declarations of differing scope under article 287 of the Convention'* the jurisdiction of the court *'exists only to the extent to which the substance of the declarations of the two parties to a dispute coincides.'*²⁷⁸

If no declaration is made, any dispute that arises regarding *military activities, including military activities by government vessels and aircrafts engaged in non-commercial service*, are subject to the dispute settlement procedures regardless of the unmanned nature of the craft involved. The exception provided for in Article 298(1)(b) of the UNCLOS focuses on the nature of the activity performed²⁷⁹ and not on the features of the crafts carrying out such activities. This means that what it is relevant for this ex-

274 R Lagoni, 'Preamble' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1-16, at p. 7.

275 Article 298(1)(b) UNCLOS; for a summary of declarations made under Article 298 of the UNCLOS, see Rothwell and Stephens (n 94), at p. 492.

276 Article 298(3) UNCLOS.

277 Article 298(2) UNCLOS.

278 See ITLOS *'M/V Louisa Case' No. 18 (Saint Vincent and the Grenadines v. Kingdom of Spain)* Judgment (2013) para. 81 available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_18_merits/published/C18_Judgment_280513.pdf.

279 See Oxman (n 265), at p. 407.

ception to apply is the military nature or the law enforcement activities performed by the State and not the manned or the unmanned nature of the vessel involved.

2.2 Disputes concerning navigational rights of unmanned vessels and UMs

This report argued that unmanned vessel and UMs are likely to enjoy navigational rights, notably the right of innocent passage in the territorial sea of third States. It also defended that laws and regulations of the coastal State passed in accordance with Article 21 of the UNCLOS shall not hamper the innocent passage, require or impose conditions for the exercise of the right of innocent passage beyond those laid down in the UNCLOS. Potential conflicts regarding innocent passage of unmanned vessels and UMs are intrinsically connected with freedom of navigation and can be submitted to the regime of settlement of disputes under UNCLOS, Part XV, as provided for in Article 297(1)(a) of the UNCLOS.

2.3 Disputes regarding unmanned vessels and UMs used for MSR

Article 264 of the UNCLOS provides that disputes concerning the interpretation or application of the Convention with regard to MSR shall be settled in accordance with Part XV, Section 2 and 3 of the UNCLOS. Therefore, disputes concerning the use of unmanned vessels and UMs for MSR are subject to the UNCLOS compulsory dispute settlement mechanisms, unless the dispute falls within the exceptions laid down in Article 297(2)(a)(i)(ii) of the UNCLOS regarding the exercise of a right of discretion of the coastal State in accordance with Articles 246 and 253 of the UNCLOS.

Accordingly, refusal of the coastal States to grant consent to the use of unmanned vessels or UMs for MSR projects is not subject to compulsory dispute settlement mechanisms, in the following situations:

- When unmanned vessels or UMs are going to be used for the collection and processing of data of direct significance for the exploration and exploitation of natural resources, whether living or non-living;
- When unmanned vessels or UMs are going to be used in projects involving the continental shelf, the use of explosives or the introduction of harmful substances into the marine environment;
- When unmanned vessels or UMs are involved in the construction, operation or use of artificial islands, installations and structures referred to in Articles 60 and 80 of UNCLOS;

- When unmanned vessels or UMs are used by States that have outstanding obligations to the coastal States from a prior research project.

Decisions of the coastal States regarding the conditions for the suspension or cessation of MSR in the EEZ and on the continental shelf, as laid down in Article 253 of the UNCLOS are also within the discretionary power of the State. UMs authorized as a method of research in MSR projects that are suspended or terminated shall be recovered from the marine environment. Since the disputes regarding the aforementioned issues are not subject to the UNCLOS compulsory mechanism the ICJ, ITLOS or even an arbitral tribunal cannot be called upon to resolve the case. The only option left is the submission of the dispute to a compulsory conciliation under Annex V of the UNCLOS.²⁸⁰ Yet, the commission that is created is not empowered to deliver a binding decision under Article 246(5)(6).²⁸¹

An important note shall be made regarding potential disputes arising around the qualification of UMs as an appropriate method of research as laid down in Article 240(b) of UNCLOS. The UNCLOS imposes no specific prohibitions on means or methods of research, which may induce the conclusion that, in principle, any equipment, including UMs, which do not result in the violation of the rights set for in the UNCLOS, can be employed as a lawful method of research.²⁸² Restrictions imposed by coastal States to the use of UMs in MSR projects based on the argument that UMs are not an appropriate method of research shall be submitted to compulsory procedures entailing binding decisions under Article 264 of the UNCLOS because these cases do not fall into any category of Article 297 of the UNCLOS.

Dispute regarding the use of UMs for MSR in the Area will be subject to the exclusive jurisdiction of the Seabed Dispute Chamber of ITLOS.²⁸³

3. The use of evidence collected by UMs in international courts

In international adjudication, evidence refers not only to information that is collected and submitted to a tribunal by the parties but also to information collected by the tribunal itself. In both cases the purpose of the evidence is to prove or to disprove

280 Serdy, 'Article 297' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 1906-1918 p. 1909.

281 *Ibid.*

282 Matz-Lück, 'Article 240' (n 196), at p. 1621.

283 Article 187, UNCLOS and Annex VI; Articles 35-40, UNCLOS.

alleged facts that are relevant to the merits of the case.²⁸⁴ Contrary to the rigidity of evidentiary rules that apply in some domestic legal systems, in international courts, notably in ITLOS and in the ICJ there is a certain degree of flexibility regarding evidence. States are given ‘*considerable freedom to submit what they consider to be relevant*’²⁸⁵ for the case. There are no restrictions regarding the type of evidence that may be submitted and merely some formal procedures shall be observed for its submission. Judges are free to evaluate evidence produced by the parties as they wish,²⁸⁶ in accordance with the principle of free assessment, but are still under the obligation to indicate how they reach their conclusions.

3.1 ITLOS

ITLOS is a permanent tribunal created under Annex VI of the UNCLOS open to all UNCLOS State parties and the EU,²⁸⁷ dedicated to resolving law of the sea disputes regarding the interpretation and the application of the UNCLOS.²⁸⁸

Besides its contentious jurisdiction to entertain disputes, the tribunal may also give advisory opinions on legal questions regarding the UNCLOS or provided for in an international agreement related to the provisions of the UNCLOS.²⁸⁹ ITLOS comprises a Sea Bed Dispute Chamber with distinctive jurisdiction, including the capacity to provide advisory opinion, and other three specific chambers created for dealing with particular categories of disputes:²⁹⁰ the Chamber for Fisheries Disputes, the Chamber for Marine Environment Disputes, the Chamber of Summary Procedure.²⁹¹ The decisions of ITLOS are final and binding to the parties in a dispute, which are under the obligation to comply with the tribunal’s award.²⁹²

Annex VI of the UNCLOS establishes ITLOS’ structure, composition and basic rules of procedures for the operation of the tribunal. To complement these rules,

284 R Wolfrum, ‘Taking and Assessing Evidence in International Adjudication’ in T Ndiaye and R Wolfrum (eds), *Law of the Sea, Environmental Law and Settlement of Disputes, Liber Amicorum Judge Thomas A. Mensah*, (Martinus Nijhoff Publishers, Leiden/Boston), 341-356, at. p 342.

285 *Ibid.*, at p. 348.

286 *Ibid.*, at p. 343.

287 The EU is an international organization within the scope of Article 305(f) and Article 1 Annex IX, since it is constituted by States to which its members have transferred competences over matters governed by the UNCLOS.

288 Articles 20, 21 Annex VI, UNCLOS.

289 ITLOS, *Sub-Regional Fisheries Commission No. 21 (2015) Advisory Opinion* para. 219, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no.21/advisory_opinion_published/2015_21-advop-E.pdf.

290 Article 15 Annex VI, UNCLOS.

291 Rothwell and Stephens (n 93), at p. 495.

292 Article 33 Annex VI, UNCLOS.

ITLOS has also approved the Rules of the Tribunal (ITLOS/8), adopted on 28 October 1997,²⁹³ the Resolution on the Internal Judicial Practice of the Tribunal (ITLOS/10) adopted on 31 October 1997,²⁹⁴ and the Guidelines concerning the Preparation and Presentation of Cases Before the Tribunal adopted on 28 October 1997.²⁹⁵

The Resolution on the Internal Judicial Practice of the Tribunal and the Guidelines concerning the Preparation and Presentation of Cases Before the Tribunal contain no rules regarding evidence. The Rules of the Tribunal provide some guidance regarding evidence to be presented by the Parties, but orientations are very general and not related to the appreciation of evidence.

The Rules of the Tribunal provide no general provision determining the type of evidence that may be presented by the Parties, but they do refer to evidence given by documents,²⁹⁶ by witness or experts²⁹⁷ and even mention the possibility of obtaining evidence at a place or locality to which the case relates.²⁹⁸

It is the Tribunal that, after ascertaining the views of the parties, determines the method of handling evidence, of examining any witness and expert, and the number of counsel and advocates to be heard on behalf of each party. Thus, it is the Tribunal that decides whether or not evidence collected by UMs can be used as a mean of proof, but are the parties that, in sufficient time before the opening of the oral proceedings, have to communicate to the Registrar of ITLOS, information regarding any evidence which it intends to produce or which intends to request to the Tribunal to obtain.²⁹⁹

Article 71 of the Rules of the Tribunal only refers to ‘documents.’ It is broadly accepted that this term shall be interpreted widely in order to include ‘maps, charts, photographs and video films-’ *In other words, if after the close of the written proceedings a party requests permission to show a video film during the oral proceedings, the procedures set out in article 71 become applicable.*³⁰⁰ One can give as an example

293 ITLOS, *Rules of the Tribunal*, as amended on 15 March 2001, 21 September 2001, 17 March 2009, and 28 September 2018; an updated version can be downloaded at https://www.itlos.org/fileadmin/itlos/documents/basic_texts/Itlos_8_E_25.09.18.pdf.

294 ITLOS, *Resolution on the International Judicial Practice of the Tribunal* (1997), available at https://www.itlos.org/fileadmin/itlos/documents/basic_texts/Itlos.10.E.27.04.05.pdf.

295 ITLOS, *Guidelines Concerning and Presentation of Cases Before the Tribunal* (1997), available at https://www.itlos.org/fileadmin/itlos/documents/basic_texts/Itlos.9.E.14.11.06.pdf.

296 Articles 63, 71, Rules of the Tribunal (n 293).

297 *Ibid.*, Article 77(2).

298 *Ibid.*, Article 81.

299 *Ibid.*, Article 73.

300 D Anderson, ‘Article 71’ in P C Rao and Ph. Gautier (eds), *The Rules of the International Tribunal for the Law of the Sea: A Commentary* (Martinus Nijhoff Publishers, Leiden/Boston), 205-208, at p. 208.

of a video film that was presented by one party, in the ‘*Camouco*’ Case, where ITLOS admitted presentation of a video film by Panama.³⁰¹

Accordingly, this report argues that evidence collected by UMs can be submitted under the category of documentary evidence. Consequently, such evidence shall observe the formal requirements set forth in Article 63 of the Rules of the Tribunal, which requires the party that presents, for instance, a video captured by a UM, to present the original file, to exhibit and to proceed with its registration at the Registrar. Formally, the Rules of the Tribunal do not put any restriction on the use of evidence collected by a UM. As scientific equipment, UMs may be able to collect different types of information that can be reproduced either by a document through transcriptions or photography, or by sound and video. As long as there is no reason to suspect that the information provided by the UMs is not accurate, or unlawfully obtained, in principle, the evidence collected shall be treated and assessed as any other document presented by the parties. It seems that from ITLOS Statute and Rules of the Tribunal no hierarchy exists between different types of evidence. Consequently, despite the freedom that the court has to assess evidence, there is no objective reason to consider that the probative value of any evidence presented by UMs is less important than any other source of evidence.

3.2 ICJ

Created by the UN Charter, the ICJ is the principal judicial organ of the UN.³⁰² It is the guardian of the legality for the international community as a whole³⁰³ with jurisdiction to entertain matters specially provided for in the UN Charter or in treaties or conventions in force.³⁰⁴ The ICJ is open to all member State of the UN, which are *ipso facto* parties to the ICJ Statute.³⁰⁵ It holds jurisdiction not only to decide disputes between States but also to give advisory opinions when requested by the UN Security Council or the UN General Assembly.³⁰⁶

301 See ITLOS *The ‘Camouco’ Case* Judgement (2000) para. 17, available at https://www.itlos.org/fileadmin/itlos/documents/cases/case_no_5/published/C5-J-7_feb_20.pdf.

302 The Statute of the International Court of Justice is an integral part of the UN Charter; see Article 92, the UN Charter (n 149).

303 ICJ Case ‘*Concerning Questions of Interpretation and Application of the 1971 Montreal Convention arising from the Aerial Incident at Lockerbie*’ (*Libyan Arab Jamahiriya v United Kingdom*) Dissenting Opinion of Judge Sir Robert Jennings, (1998), available at <https://www.icj-cij.org/files/case-related/88/088-19980227-JUD-01-00-EN.pdf>.

304 Article 36(1), ICJ Statute (n 20).

305 Article 93 of the UN Charter (n 149); for information on the advisory role of the ICJ, see M. Pomerance ‘The Advisory Role of the International Court of Justice and Its ‘Juricial’ Character: Past and Future Prisms’ in A S Muller D Raič and J M Trószky (eds), *The International Court of Justice Its Future Role After Fifty Years* (Martinus Nijhoff Publishers, the Hague/ Boston/ London, 1997), at pp. 271-323.

306 Article 65, ICJ Statute (n 20) and Article 96, UN Charter (n 149).

ICJ's jurisdiction to decide disputes regarding the interpretation or application of the UNCLOS is specifically granted by Article 287(i)(b) of the UNCLOS. The ICJ case law dealing with the law of the sea issues has been very important for the development of the law of the sea, mainly regarding maritime delimitation, fisheries and the right of innocent passage.³⁰⁷

The ICJ's core regulations are set forth on its Statute, approved as Annex to the UN Charter, and complemented by the Rules of Court and Practice Directions approved by the ICJ itself, under the scope of Article 30 of its Statute. The ICJ Rules of Court were first drafted in 1946, revised in 1972 and in 1978;³⁰⁸ the Practice Directions were prepared in 2001, and revised in 2009 and in 2013, and are aimed at interpreting and implementing the ICJ Statute and the Rules of Court.³⁰⁹

Articles 48 to 52 of the ICJ Statute provide some guidance and orientation regarding the production of evidence in cases before the ICJ. Overall, such rules mainly deal with the production of documentary evidence,³¹⁰ evidence given by witness and experts,³¹¹ and the role of the Court collecting evidence.³¹²

Evidence collected by UMVs can be submitted under the category of documentary evidence, provided that the formal procedures set forth in Article 50 of the ICJ Rules of Court are observed. The term '*document*' has been interpreted broadly in order to include not only texts of treaties, national laws and regulations, diplomatic information and correspondence, national case law, written opinions, declarations, and commentaries, but also to include maps, charts, photographs, video presentations.³¹³ Therefore, evidence collected by UMVs may have the form of video film or sound, photography and even written information transcript to a document. There are some interesting cases before the ICJ dealing with different type of evidence presented by the parties. In the '*Gabčíkovo-Nagymaros Project*' Case, between Hungary and Slo-

307 For more information on the role of the ICJ in the law of the sea developments, see V Lowe and A Tzanakopoulos, 'The Development of the Law of the Sea by the International Court of Justice' in C J Tams and J Sloan (eds), *The Development of International Law by the International Court of Justice*, (Oxford University Press, Oxford, 2013), at pp.177-193.

308 See *ICJ Rules of Court*, available at <https://www.icj-cij.org/en/rules>; see also H. Thirlway, 'The International Court of Justice' in M. D. Evans (ed), *International Law* (Oxford University Press, Oxford, New York), 586-614, at p. 590.

309 See *ICJ Practice Directions*, available at <https://www.icj-cij.org/en/practice-directions>.

310 Articles 49, 50, 56, 57, ICJ Rules of Court (n 308).

311 *Ibid.*, Articles 63, 65.

312 *Ibid.*, Articles 62, 66-69.

313 Wolfrum (n 284), at. p 349.

vakia, the ICJ admitted the use of a video cassette as evidence.³¹⁴ In the '*Kasikili/Sedudu Island*' Case, between Botswana and Nigeria,³¹⁵ the court accepted as evidence satellite information and aerial photography in order to determine the legal status of the island.³¹⁶ In the case Concerning the '*Land and Maritime Boundary between Cameroon and Nigeria*', the ICJ admitted the transmission of a video subject to the condition of the communication of the video to the Registrar and to the other party.³¹⁷

In 2013, the ICJ adopted the '*Practice Directions IXquarter*' 2013 regarding submission of unproduced, audio-visual or photographic materials at the oral proceedings stage that shall be observed.

'Practice Direction IXquarter

1. Having regard to Article 56 of the Rules of Court, any party wishing to present audio-visual or photographic material at the hearings which was not previously included in the case file of the written proceedings shall submit a request to that effect sufficiently in advance of the date on which that party wishes to present that material to permit the Court to take its decision after having obtained the views of the other party.
2. The party in question shall explain in its request why it wishes to present the audio-visual or photographic material at the hearings.
3. A party's request to present audio-visual or photographic material must be accompanied by information as to the source of the material, the circumstances and date of its making and the extent to which it is available to the public. The party in question must also specify, wherever relevant, the geographic co-ordinates at which that material was taken.
4. The audio-visual or photographic material which the party in question is seeking to present shall be filed in the Registry in five copies. The Registrar shall communicate a copy to the other party and inform the Court accordingly.

314 ICJ Case '*Concerning the Gabčíkovo-Nagymaros Project*' (n. 30) para. 8., available at <https://www.icj-cij.org/files/case-related/92/092-19970925-JUD-01-00-EN.pdf>.

315 See ICJ Case *Concerning Kasikili/Sedudu Island* (n 31), at paras. 29, 33 and 36.

316 For more information on the admissibility of aerial photographs in the Texas, see K. Hufstetler, 'The Admissibility of aerial photographs – Evidentiary Foundations' (2016) 47(4) *St. Mary's Law Journal*, at pp. 857-888.

317 S Rosenne, *The Law and Practice of the International Courts, 1920-2005* (Vol III) (Martinus Nijhoff Publishers, Leiden/Boston, 2006), at p. 124.

5. It shall be for the Court to decide on the request, after considering any views expressed by the other party and taking account of any question relating to the sound administration of justice which might be raised by that request.’

Besides the aforementioned guidelines, there are no additional or other general rules regarding the admissibility of documents before the ICJ. Therefore, as it was defended regarding the submission of evidence collected by UMVs before ITLOS, there are no objective reasons to impose additional burdens on evidence that was collected by UMVs based on the fact that a UMV was used and not any other device.

3.3 Arbitral Tribunals

Besides ITLOS and the ICJ, Article 287(1)(c)(d) of the UNCLOS opens the possibility to States to present their cases to *ad hoc* arbitral tribunals constituted in accordance with Annex VII of the UNCLOS or to a special arbitral tribunal constituted in accordance with Annex VIII of the UNCLOS for the following categories of disputes: fisheries, protection and preservation of the marine environment, marine scientific research, navigation, including pollution from vessels and by dumping.

In both cases,³¹⁸ institution of the proceedings starts with a written notification addressed to the other party or parties in the dispute accompanied by a statement of the claim and the grounds on which it is based.³¹⁹ After the appointment of the judges and the constitution of the arbitral tribunal is the tribunal itself that shall determine its own procedures.³²⁰ Normally, the PCA is the tribunal that administers the arbitrations and acts as a Registrar for arbitral tribunals created under Annex VII of the UNCLOS.³²¹

PCA was established by the Convention for the Pacific Settlement of International Disputes,³²² done at Hague in 1899, during the first Hague Peace Conference. The Convention was revised in 1907 in the Second Hague Peace Conference.³²³ The

318 Article 4 of Annex VII states that Articles 4 to 13 of Annex VII apply, *mutatis mutandis*, to the special arbitration established under Annex VIII.

319 Article 1 Annex VII, UNCLOS.

320 *Ibid.*, Article 5 Annex VII.

321 A list of the cases that the PCA has administered under Annex VII of the UNCLOS, is available at <https://pca-cpa.org/en/services/arbitration-services/unclos/>.

322 Convention for the Pacific Settlement of International Disputes, (Hague, 1899, in force 29 July 1899), available at <https://pca-cpa.org/wp-content/uploads/sites/6/2016/01/1899-Convention-for-the-Pacific-Settlement-of-International-Disputes.pdf>. Portugal is member to the PCA since 1900.

323 Revised Convention for the Pacific Settlement of International Disputes (Hague 1907, in force 26 January 1910, is available at <https://pca-cpa.org/wp-content/uploads/sites/6/2016/01/1907-Convention-for-the-Pacific-Settlement-of-International-Disputes.pdf>.

PCA was established as an intergovernmental organization aimed at providing different types of solutions for dispute resolution between States.³²⁴

The PCA Arbitration Rules³²⁵ were revised in 2012 and comprise procedural rules that are available for the parties to use for the arbitration of dispute including some orientation with regard to evidence. Along with Arbitration Rules, optional PCA's Rules of Procedures were also adopted, but provide no instructions regarding evidence.³²⁶

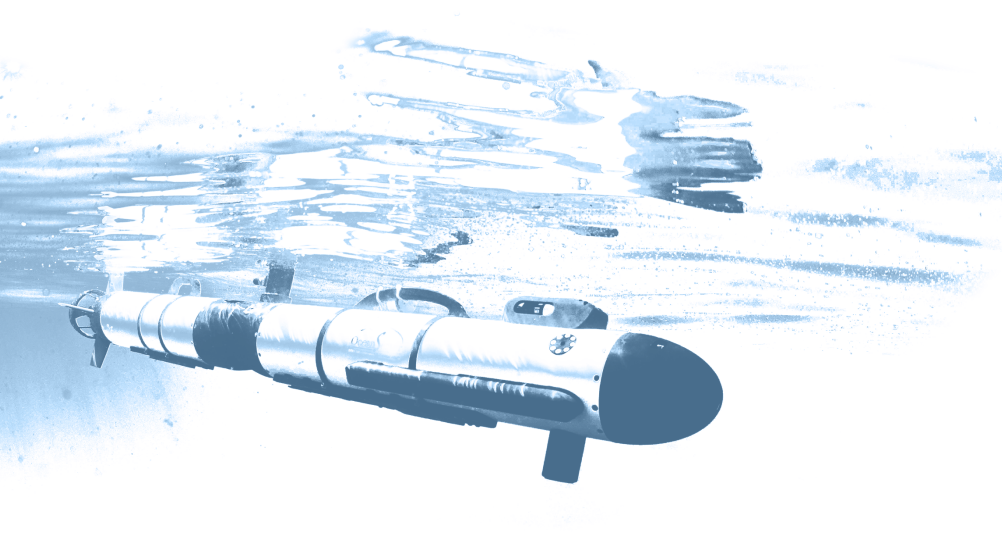
Article 27 of the PCA Arbitration Rules offers very generic guidance regarding evidence. It mainly admits the presentation of witness, documents or other evidence as well as the chance for the arbitral tribunal to perform a site visit. The reference to '*other evidence*' in Article 27 seems to open the door for video films, photographs and other kinds of evidence to be presented. Thus, this report argues that the approach regarding the presentation of evidence collected by UMs is the same defended for ITLOS and for the ICJ.

Nevertheless, contrary to what happens with ITLOS and with the ICJ, when a case is submitted to an arbitral tribunal in accordance with Annex VII of the UNCLOS, the parties are free to adopt complementary rules of procedures to determine additional rules for the case to be conducted. Normally, these rules regulate procedural aspects, such as commencement of the proceedings, representation and assistance, objections, expenses and costs, place for meetings and hearings, and evidence.

324 Article 20 of the 1899 Convention (n 322).

325 PCA Arbitration Rules 2012 (2012), available at <https://pca-cpa.org/wp-content/uploads/sites/6/2015/11/PCA-Arbitration-Rules-2012.pdf>.

326 PCA, Rules of Procedure (2012), available at <https://pca-cpa.org/wp-content/uploads/sites/6/2016/01/Rules-of-Procedure-of-the-Administrative-Council-of-the-Permanent-Court-of-Arbitration.pdf>.



PART 2

NATIONAL LAW

Chapter 1

OVERVIEW OF THE PORTUGUESE MARITIME LEGAL SYSTEM

1. Portuguese maritime zones

The territory of Portugal comprises, in accordance with Article 5 of the Constitution of the Portuguese Republic (CRP),³²⁷ the territory on the European mainland that is historically defined as Portuguese, together with the Azores and Madeira archipelagos. The CRP does not define the extent and the limits of Portuguese maritime areas but rather leaves to ordinary law the task of defining the extent and limit of Portugal's territorial waters, its EEZ and its rights to the adjacent seabed.³²⁸

Law No. 34/2006, of 28 July³²⁹ determines that Portugal exercises sovereignty or jurisdiction over internal waters, territorial sea, contiguous zone, EEZ and the continental shelf, in accordance with the UNCLOS.³³⁰

327 Constitution of the Portuguese Republic (Lisbon, 2 April 1976, in force 25 April 1976), as last amended in 2005, available at <http://www.parlamento.pt/Legislacao/Paginas/ConstituicaorepublicaPortuguesa.aspx>.

328 *Ibid.*, Article 5(2).

329 Law No. 34/2006, of 28 July it determines the extent of the Portuguese maritime zones under national sovereignty or jurisdiction, the powers exercised therein by the Portuguese State and the powers exercised on the high seas, available at <https://dre.pt/application/file/a/539336>.

330 *Ibid.*, Article 2.

Portuguese internal waters are those between the coastal line and the landward side of all baselines. Internal waters are part of the Portuguese maritime public domain.³³¹

The outer limit of the Portuguese territorial sea extends up to 12 nautical miles from the point closest to the baselines.³³²

The Portuguese territorial sea covers a total area of 50.957 km², of which 23,663 km² corresponds to the territorial sea of the Autonomous Region of Azores, and 10,834 km² to the territorial sea of the Autonomous Region of Madeira.

The outer limit of the Portuguese contiguous zone extends up to 24 nautical miles from the point closest to the baselines.³³³

The outer limit of the Portuguese EEZ extends up to 200 nautical miles from the point closest to the baselines.³³⁴ The Portuguese baselines, which can be normal or straight, are defined in Decree-Law No. 495/85, of 29 November.³³⁵

The Portuguese EEZ reflects the autonomy that the CRP gives to the Autonomous Regions of Azores and Madeira. As a result, Law No. 34/2006, of 28 July subdivides the Portuguese EEZ into 3 sub areas, as follows:

- Sub area 1 – Mainland sub area, which covers 287 521 km²;
- Sub area 2 – Madeira sub area, which covers 442 248 km²;
- Sub area 3- Azores sub area, which covers 930 687 km².³³⁶

These sub areas can be divided still further into smaller areas for specific purposes.³³⁷

The reference to the EEZ in the CRP was only introduced by the 1982 Constitutional Revision,³³⁸ as a consequence of its creation by Law No. 33/77 of 28 May,

331 M Guedes, *Direito do Mar*, (2nd ed. Coimbra Editora, 1998), at p. 95.

332 Article 6, Law No. 34/2006, of 28 July (n 329).

333 *Ibid.*, Article 7.

334 *Ibid.*, Article 8.

335 Decree-Law No. 495/85, of 29 November, which define the Portuguese baselines, available at <https://dre.pt/application/file/a/170415>.

336 Information on the dimension of the maritime zones under Portuguese sovereignty or jurisdiction is provided by the Directorate General of Natural Resources, Safety and Maritime Services- DGRM (*Direção Geral dos Recursos Naturais, Segurança e Serviços Marítimos*) at its website available at <https://www.dgrm.mm.gov.pt/am-ec-zonas-maritimas-sob-jurisdicao-ou-soberania-nacional>.

337 Article 11(2) Law No. 34/2006 (n 329).

338 For more information on the historical context of the EEZ in Portugal, see Guedes (n 331), pp. 170-178.

(repealed), and represents a key step for Portugal to exercise its rights over the EEZ. Countries refraining from claiming an EEZ on their internal legislation, subject the superjacent waters above their continental shelf to the regime of the high seas.³³⁹

The outer limit of the Portuguese continental shelf extends up to the outer edge of the continental margin, or to a distance of 200 nautical miles from the baselines where the outer edge of the continental margin does not extend up to that distance.³⁴⁰ Law No. 34/2006 of 28 July, does not specifically provide any reference to the extension of the continental shelf, neither this is necessary from an international law perspective. The rights of the coastal State over its continental shelf do not depend on occupation effective or notional, or on any express proclamation.³⁴¹ This does not preclude a country from declaring the existence of the continental shelf, but this declaration is not constitutive of rights. As highlighted in the ICJ in the '*North Sea Continental Shelf*' Cases, the rights over the continental shelf do exist *ipso facto* and *ab initio*³⁴². This is also true in the case of the extended continental shelf beyond 200 nautical miles, regardless of the special regime provided for in Article 76 of the UNCLOS. As reinforced in the 2012 ITLOS '*Bangladesh Myanmar*' Case, the rights of the coastal State over the continental shelf do not require the establishment of outer limits.³⁴³ This position is confirmed by States' practice.³⁴⁴

In any case, the domestic legal order came to recognize the extended continental shelf years later, in Law No. 17/2014, of 10 April that establishes the legal framework for national marine spatial planning and management policy, which clearly refers to the extended continental shelf beyond 200 nautical miles.³⁴⁵

On 11 May 2009, Portugal submitted to the CLSC information regarding the limits of the continental shelf beyond 200 nautical miles in accordance with Article 76(8) of the UNCLOS. This submission was amended and completely replaced on 1 August 2017.³⁴⁶ The process was carried out by the Portuguese Task Group for the Extension of the Continental Shelf, whose the role and functions are currently governed by the

339 A Proelss, 'Article 55' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 408-418, at p. 410.

340 Article 9, Law No. 34/2006, of 28 July (n 329).

341 Article 77(3) UNCLOS.

342 ICJ *North Sea 'Continental Shelf Cases'* (n 201), paras 19, 39.

343 ITLOS '*maritime boundary between Bangladesh and Myanmar in the Bay of Bengal*' (n 202) para. 409.

344 T L McDorman 'The Continental Shelf' in D Rothwell, A. G Elferink, K N Scoot, T Stephens (eds), *The Oxford Handbook of the Law of the Sea* (Oxford University Press, the United Kingdom, 2015), 181-202, at p. 191.

345 Law No. 17/2014, of 10 April, which establishes the legal framework for national marine spatial planning and management policy, available at <https://dre.pt/application/file/a/25344086>.

346 Executive Summary Continental Shelf Submission Portugal (2017 update), available at http://www.un.org/depts/los/clcs_new/submissions_files/prt44_09/prt2017executivesummary.pdf.

Resolution of the Council of Ministers No. 84-A/2016 of 28 December.³⁴⁷ At the moment, CLCS is analyzing the Portuguese submission, but it is expected that it will take several years until the process is completed and the final recommendations are issued.

2. Search and rescue zones

The search and rescue activities under the scope of the Portuguese authorities are not subject to the maritime zoning laid down in the UNCLOS neither in Law No. 34/2006, of 28 July but rather to the 1979 International Convention on Maritime Research and Rescue (SARC), in force in Portugal since 29 November 1985.³⁴⁸

SARC was adopted within the IMO context with the view to creating an international regime covering search and rescue operations in order to effectively implement the obligation of the States to provide assistance to ships in distress, as enshrined in Article 98 of the UNCLOS. SARC was amended in 1998 and in 2004 and it imposes considerable obligations on States, such as *i)* the obligation to ensure that assistance is provided to any person in distress at sea, regardless of the nationality or status of such person or the circumstances in which that person is found; *ii)* the obligation to provide for their initial medical or other needs; *iii)* the obligation to put them to in a place of safety.

After the adoption of SARC and SAR Plans, the IMO's Maritime Safety Committee defined 13 maritime search and rescue areas, in each of which the countries involved have specific search and rescue regions, which do not correspond to the areas where they exercise sovereignty or jurisdiction under the UNCLOS.

At the domestic level, the Portuguese search and rescue areas are regulated in Decree-Law No. 15/94, of 22 January, as amended by Decree-Law No. 399/99, of 14 October.³⁴⁹ However, the maritime areas wherein Portuguese authorities are bound to exercise search and rescue activities were last amended by the IMO circular [SAR.8/Circ.4](#), 1 December 2012. This amendment is still to be properly incorporated into the national legal system.

³⁴⁷ Resolution of the Council of Ministers No. 84-A/2016, of 28 December, Portuguese Task Group for the Extension of the Continental Shelf, available at <https://dre.pt/application/file/a/105634971>.

³⁴⁸ International Convention on Maritime Search and Rescue (Hamburg, 27 April 1979, in force 22 June 1985); in Portugal, see Government Decree No. 32/85, of 16 August, available at <https://dre.pt/application/file/180476>.

³⁴⁹ See Decree-Law No. 15/94, of 22 January, which creates the National Search and Rescue System, available at <https://dre.pt/application/file/a/511964>; see also Decree-Law No. 399/99 of 14 October, which amends the National Search and Rescue System, available at <https://dre.pt/application/file/a/666865>.

At the moment, search and rescue areas that are under the responsibility of the Portuguese authorities are divided into 3 main subareas and their coordination is carried out from Lisbon, Ponta Delgada, and Funchal. There is an area southwest of the Madeira Archipelago that after being subject to the overlapping supervision of Portugal and Spain is currently under no supervision.

It is also important to refer to the Agreement between the United States of America and the Portuguese Republic on Aeronautical and Maritime Search and Rescue signed in 2017 and approved by Decree No. 17/2007, of 5 June³⁵⁰ to promote cooperation between both States in aeronautical and maritime search and rescue operations.

3. The autonomy of Azores and Madeira regarding unmanned vessels and UUVs

The territory of Portugal comprises, besides the mainland, the archipelago of Azores and Madeira. Despite this fact, Portugal is not an archipelagic State within the concept of Article 46 of the UNCLOS since it is not wholly constituted by one or more archipelagos, but rather it includes the mainland.³⁵¹

At the domestic level, CRP recognizes the special geographic, economic, social and cultural characteristics of Azores and Madeira, which are considered as Autonomous Regions with legislative and executive autonomy.³⁵² However, this does not transform Portugal as a Federal State. Portugal is a unitary State and the autonomy of Azores and Madeira does not affect the integrity of the sovereignty of the State.³⁵³

Each archipelago holds its own political and administrative regime comprising a self-government and a regional parliament elected by direct universal suffrage, with broad political and legislative competences. The Political and Administrative Statute of the Autonomous Region of Azores (EPARAA) was approved by Law No. 39/80, of 5 August, and it was amended three times, by Law No. 9/87, of 26 March, Law No. 61/98, of 27 August and by Law No. 2/2009, of 12 January.³⁵⁴ The Political and Administrative Statute of the Autonomous Region of Madeira (EPARAM) was approved

350 Decree No. 17/2017, of 5 June, which approves the Agreement between the United States of America and the Portuguese Republic on Aeronautical and Maritime Search and Rescue, available at <https://dre.pt/application/file/a/107468976>.

351 T Markus, 'Article 46' in Proelss (ed), *United Nations Convention on the Law of the Sea: A Commentary* (C.H. Beck, Hart, Nomos, Munchen, 2017), 334-351, at pp. 336, 347.

352 See Articles 5(1) and 225(1) CRP.

353 *Ibid.*, Articles 6 and 225(3).

354 See Law No. 2/2009, of 12 January. An updated version of EPARAA, available at <https://dre.pt/application/file/a/397382>.

by Law No. 13/91, of 5 July, and it was amended twice, by Law No.130/99, of 21 August and by Law No. 12/2000 of 21 June.³⁵⁵

Both Azores and Madeira are political legal entities endowed with several responsibilities, powers, and duties, not only at the regional level but also at the central and international levels.³⁵⁶ Such autonomy is designed to ensure democratic participation of the citizens and to promote economic and social development and the interests of the regions.³⁵⁷

At the international level, the Autonomous Regions are entitled to participate in the decision-making process regarding the international policy of the Portuguese State and to conduct their own international policy of the region,³⁵⁸ particularly in issues that may directly concern the autonomy of the region,³⁵⁹ such as those related to the territorial sea, the EEZ, the continental shelf,³⁶⁰ and ocean pollution.³⁶¹ These rights shall be exercised in accordance with the general principle that determines that the State is unitary³⁶² as well as in accordance with the principles set forth in Article 7 of the CRP.

At the central level, the Autonomous Regions of Azores and Madeira are entitled to participate in the definition of policies concerning territorial waters, the EEZ, and the adjacent seabeds.³⁶³ This prerogative is automatic in the sense that the Autonomous Regions do not have to demonstrate that those are issues that concern the interests of the Region.³⁶⁴ The participation in this process shall be carried out by the Regional Government.³⁶⁵

355 Law No.13/91, of 5 June, which approves EPARAM, available at <https://dre.pt/application/file/a/629574>; Law No. 130/99, of 21 August EPARAM first amendment, available at <https://dre.pt/application/file/a/434172>; Law No. 12/2000, of 21 June, EPARAM second amendment, available at <https://dre.pt/application/file/a/303684>.

356 For the purpose of this report regional level means the level of each archipelago; central level stands for the participation in the State's decision-making process, and international level refers to the international policy of the Portuguese State and the Autonomous Regions.

357 Article 225(2) CRP.

358 R T Lanceiro, 'The International Powers of the Portuguese Autonomous Regions of Azores and Madeira' 2010(51) *Revista da Faculdade de Direito da Universidade de Lisboa* 293-320, at p. 295.

359 Some discussions on the concept and the concrete meaning of the term 'concern' in this context can be found at *Ibid.*, at p 296.

360 Article 121(2)(b) EPARAA (n 354).

361 Article 94, EPARAM (n 355).

362 Lanceiro, (n 358), at p. 301.

363 Article 227(1)(s), CRP.

364 Amendments introduced in 2009 to Article 8 of EPARAA clarified the powers of the Autonomous Regions of Azores, and identified different types of management over the maritime areas adjacent to the region: joint management, shared management and exclusive management.

365 Article 88(e) EPARAA (n 354); Article 69(s) EPARAM (n 355).

At the regional level, the Autonomous Regions are entitled to exercise political, legislative and administrative competence. Within this power, both EPARAA and EPARAM have dispositions regarding ocean-related issues and activities that might be connected with the legal regime applicable to autonomous vessels and UUVs. The EPARAA is very clear and determines a set of areas where the Region holds legislative competence. The EPARAM adopts a different approach, it establishes the legislative competence of the Legislative Regional Assembly and then, in one provision, points out the areas where the Region holds interests. In a nutshell, the Autonomous Regions hold autonomy in the following areas that, in one way or another, may be related to the legal regime of autonomous vessels and UUVs:

- **Fisheries**- the Autonomous Regions of Azores is entitled to legislate in matters regarding fisheries, sea and marine resources. Particularly, the regulatory power covers *'fishing vessels that carry out their activity in the inland waters and territorial seas belonging to the territory of the Region or registered in the Region.'*³⁶⁶ The autonomous region of Madeira is also entitled to legislate in fisheries and aquaculture.³⁶⁷ As a result, the Regions can impose on its regional legislation specific conditions for the use of unmanned vessels and UUVs in fisheries activities, notably requirements regarding registration.
- **Infrastructure, transports and communication**- the Autonomous Regions of Azores is entitled to legislate in matters regarding land, sea and air transportation.³⁶⁸ The autonomous region of Madeira points out, as areas of specific interest of the Region, maritime infrastructures, transport and tariffs,³⁶⁹ administration of ports, including tax and fees,³⁷⁰ and coastline.³⁷¹ This competence covers, among others, the possibility to define legal regimes regulating unmanned vessels and UUVs, provided that they are used in sea transportation.

366 Article 53(2)(e) EPARAA (n 354).

367 Article 40(f) EPARAM (n 355).

368 Article 56(2)(h) EPARAA (n 354).

369 Article 40(d) EPARAM (n 355).

370 *Ibid.*, Article 40(e).

371 *Ibid.*, Article 40(mm); the term coastline is translated in Portuguese as *'orla costeira'*. This is not a maritime area under the UNCLOS but rather a portion of the national maritime and terrestrial territory that suffers influence of the sea; Portuguese coastline extends from the shore up to 500 meters to the landside and to the bathymetry of 20 meters to the sea side; see Decree-Law No. 159/2012, of 24 July, as amended by Decree-Law No.132/2015, of 9 July that approves the rules for preparation and implementation of coastline spatial planning and the noncompliance legal regime; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1767&tabela=leis.

- **Research and technological innovation** – the Autonomous Region of Azores is entitled to legislate in matters of research and technological innovation, including in matters to support scientific and technological research.³⁷² Madeira is also empowered to regulate construction, installations and the use of infrastructures for study, observation, and MSR purposes.³⁷³ Consequently, both Azores and Madeira can pass legislation that regulate the use of UMVs in MSR activities.
- **Public safety and civil protection** – the Autonomous Regions of Azores is entitled to legislate in matters regarding public safety, particularly when it comes to oceanography, monitoring, and vigilance.³⁷⁴ Since these are areas where autonomous vessels and UMVs may require regulations, the Autonomous Region can enact appropriate legal frameworks regardless of the rules approved by the central government. The EPARAM does not provide any similar disposition.

It is not very clear whether the competences of the Autonomous Regions regarding the aforementioned areas are a legislative competence to enact laws (legislative laws) or to merely enact regulations (administrative regulations).³⁷⁵ This report is not the appropriate forum to discuss this issue.³⁷⁶ In any case, laws and regulations approved by the Autonomous Regions have their territorial scope of application limited to the Region.³⁷⁷

4. Institutional framework

The authority exercised in the maritime zone over Portuguese sovereignty or jurisdiction and over Portuguese flagged vessels sailing on the high seas is carried out within the System of the Maritime Authority (SAM), by the Navy and by the Air Force.³⁷⁸

SAM was created in 2002 by Decree-Law No. 43/2002, of 2 March as an institutional framework that is formed by central, regional and local entities, organs and services with coordination, executive, advisory and police functions that exercise

³⁷² Article 64(1)(b) EPARAA (n 354).

³⁷³ Article 40(uu) EPARAM (n 355).

³⁷⁴ Article 66(2)(c) EPARAA (n 354).

³⁷⁵ Articles 41 and 89 EPARAA (n 354); articles 39 and 69(d) EPARAM (n 355); articles 233 and 278(2) CRP.

³⁷⁶ For more information see A R Moniz, A Rocha, M C Ribeiro, R Medeiros “*Gestão Partilhada dos Espaços Marítimos – Papel das Regiões Autónomas*” (1.ª Ed, Gestlegal, 2018).

³⁷⁷ Article 227(1)(a) CRP.

³⁷⁸ Article 14, Decree-law No. No. 34/2006 28, of July (n 329).

powers of maritime authority.³⁷⁹ SAM is a transversal and complex model of organization integrating military and civil entities, technical bodies and police authorities. At the top of the hierarchy of SAM stands the National Maritime Authority (AMN), under the supervision of the Minister of Defense as the superior structure for administration and coordination of the bodies and services that integrated the Navy, have competencies or carry out actions within the scope of SAM.³⁸⁰ Within SAM, the following entities are empowered to exercise maritime authority:³⁸¹

- AMN – *Autoridade Marítima Nacional*;
- Maritime Police – *Polícia Marítima*;
- National Republican Guard – *Guarda Nacional Republicana*;
- Public Security Police – *Polícia de Segurança Pública*;
- Portuguese Criminal Police – *Polícia Judiciária*;
- Immigration and Border Service – *Serviço de Estrangeiros e Fronteiras*;
- General Fisheries Inspectorate – *Inspeção Geral de Pescas*;
- Water Institute – *Instituto da Água*;
- Maritime and Port Institute- *Instituto Marítimo-Portuário*;
- Port Authorities – *Autoridades Portuárias*;
- General Directorate for Health – *Direção Geral de Saúde*.

As set forth in their laws and regulations, the aforementioned entities, are entitled to exercise maritime authority in the maritime areas under national sovereignty or jurisdiction in accordance with international law. For the purpose of this system, the maritime authority shall be deemed as a public authority that is entitled to exercise different types of activities such as executing acts of the State, carrying out administrative procedures and maritime registries, undertaking activities to con-

379 Article 2 Decree-Law No. 43/2002, of 2 March that defines the organization and competences of SAM and creates AMN, available at <https://dre.pt/application/file/a/251895>.

380 *Ibid.*, Article 1(2). See also Article 2 Decree-Law No. 44/2002, of 2 March that establishes within SAM, the responsibilities, structure and organization of ANM, and creates the General Directorate of AMN, available at <https://dre.pt/application/file/a/251898>.

381 Article 7 Decree-Law No. 43/2002, of 2 March (n 379).

tribute to the safety of navigation, as well as the exercise of surveillance and policing activities.³⁸² In order to facilitate the articulation of actions among different entities that exercise powers of maritime authority, specific regulations were approved that impose the duty of cooperation and define specific areas to be coordinated by each entity.³⁸³ Additionally, all other services and organisms of the State have the duty to cooperate in accordance with their possibilities, in order to provide all appropriate means for their mission to be accomplished.³⁸⁴

At the local level, the maritime authority is carried out by the port captaincy (Capitania do Porto), fully integrated into the structure of the AMN. This is without prejudice to the responsibilities of the port authorities.

Until 2015, the government agency responsible for dealing with sea matters was also responsible for other areas, such as agriculture, environment, and spatial planning. However, recognizing the multidisciplinary and the crosscutting nature of the political, economic and legal issues regarding the oceans, the XXI Constitutional Government has created the Ministry of the Sea as a separate institution.

382 *Ibid.*, Article 3.

383 See Regulation (*Decreto Regulamentar*) No. 86/2007, of 12 December, it articulates the action of police authorities and other competent entities within maritime areas under national sovereignty and jurisdiction, available at <https://dre.pt/application/file/a/628729>.

384 Article 15, Law No. 34/2006, of 28 July (n 329).

Chapter 2

THE NATIONAL REGIME APPLICABLE TO UNMANNED VESSELS

Section 1

DELIMITATION OF THE CONCEPT OF VESSEL

1. Definition of vessel

The Portuguese legal framework adopts the dichotomy enshrined in the UNCLOS between ships and vessels. Ship is translated as '*navio*' while vessel is translated as '*embarcação*'. In the same vein, the domestic legislation does not grant a single definition of ship or vessel, but it rather provides different definitions.

For instance:

- **Decree-Law No. 201/98, of 10 July**- approves the legal statute of the ship, and defines it as '*any floating device intended for water navigation*,'³⁸⁵ including its main and auxiliary machines, and any equipment used on board for its operation. This Decree-Law is also important since it regulates at the national level, the conditions for granting Portuguese flag to vessels,

³⁸⁵ Decree-Law No. 201/98, of 10 July approves the legal statute of the ship, available at <https://dre.pt/application/file/a/485090>; see also Rectification Statement No. 11-P 98, of 31 July, available at <https://dre.pt/application/file/a/182312>.

therefore implementing Article 94 of the UNCLOS, and sets forth several provisions regarding construction of vessels. This diploma provides a residual definition of ship that shall be used whenever a ship is to be registered under the Portuguese flag.

- **Decree-Law No. 190/98, of 10 July**, as amended and republished by Decree-Law No. 73/2007, of 27 March- sets forth the rules and procedures regarding installation, licensing and use of radio equipment in vessels. It defines vessel or ship as any device or watercraft used or likely to be used as means of transportation in water, including floating and submersible platforms.³⁸⁶
- **Decree-Law No. 191/98, of 10 July**, as amended and republished by Decree-Law No. 9/2001, of 18 January- approves the legal regime applicable to means of rescue to be in place in national vessels. It defines vessel or ship as any device or watercraft used or likely to be used as a mean of transportation on water or with any other purpose; it also includes floating platforms and pontoons.³⁸⁷
- **Decree-Law No. 202/98, 10 July**- establishes the liability regime of ship owners. It defines ship as a floating device aimed at navigating on the water.³⁸⁸
- **Decree-Law No. 180/2004, of 27 July**, as amended and republished by Decree-Law No. 52/2012, of 7 March- transposes the EU Directive No. 2002/59/CE on establishing the Community vessel traffic monitoring and information system. It defines vessel as any sea-going vessel or craft.³⁸⁹
- **Decree-Law No. 218/2012, of 9 October** - incorporates in the national legal system the EU Directive No. 2010/65/EU on reporting formalities for ships arriving in and or departing from ports of the Member States. It defines ship as any seagoing vessel or craft.³⁹⁰

386 Article 2(r) Decree-Law No. 190/98, of 10 July as republished by Decree-Law No. 73/2007, of 27 March approves the rules and procedures regarding installation, licensing and use of radio equipment in vessels, available at <https://dre.pt/application/file/a/520298>;

387 Article 2(1)(e) Decree-Law No. 191/98, of 10 July republished by Decree-Law No. 9/2011, of 18 January approves the legal regime applicable to the means of salvation to be in place in national vessels, available at <https://dre.pt/application/file/a/280797>.

388 Article 1(a) Decree-Law No. 202/98, 10 July establishes the liability regime of the ship owners, available at <https://dre.pt/application/file/a/485094>.

389 Article 3(f) Decree-Law No. 180/2004, of 27 July as republished by Decree-Law No.52/2012, of 7 March creates the Community vessel traffic monitoring and information system, available at <https://dre.pt/application/file/a/542352>.

390 Article 3(g) Decree-Law No. 218/2012, of 9 October, which approves formalities for ships arriving in and or departing from ports of the Member States, available at <https://dre.pt/application/file/a/175648>.

- **Law No. 34/2006, of 28 July**- determines the extent of the maritime zones under Portuguese sovereignty or jurisdiction, regulates the powers exercised therein by the Portuguese State, as well as the powers exercised on the high seas. This legal framework does not define vessel or ship but it does mention the expression '*other floating devices*.'³⁹¹

The aforementioned examples demonstrate that the Portuguese legal system adopts a very wide definition of vessel and ship and do not require a craft to be manned to be considered as such. In other words, it seems that manning is not a constitutive requirement for a vessel to exist in legal terms. Consequently, in the domestic legal order, it can be argued that as long as an unmanned vessel is intended for water navigation and, when specifically required, it can be used in water transportation, it is subject to the current legal framework. This does not mean that unmanned vessels can immediately comply with the current legislation in force. In fact, despite the laws and regulations formally do not imposing a vessel to be manned, they were prepared based on such idea. Therefore, it is expected that further legislation is developed not only to amend the current legal frameworks in force but also to approve new rules and regulations, including technical specifications for construction and use of unmanned vessels.

2. Current typology applicable to unmanned vessels

The General Regulation of Captaincies approved by Decree-Law No. 265/72, of 31 July,³⁹² provides the legal framework for the classification of vessels under the Portuguese legal order. This is a legal instrument approved in 70s that it was partially repealed by other legislation and that does not mention unmanned vessels. Yet, it provides a general guidance regarding the classification of vessels based on the activity they perform, which can be also applicable to unmanned vessels, as follows:³⁹³

2.1 State vessels

Portuguese national law does not provide a definition of State vessels. Adopting an international approach, are included in the legal concept of Portuguese State vessels, vessels owned or commissioned by different types of public entities, such as the

³⁹¹ Article 16 Law No. 34/2006, of 28 July (n 329).

³⁹² Decree-Law No. 265/72, of 31 July approves General Regulations of Captaincies was amended 29 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1721&tabela=leis.

³⁹³ *Ibid.*, Article 19(1).

Portuguese Navy, the security and the police forces, notably, the Maritime Police, National Republican Guard, Public Security Police, Immigration and Border Services, vessels owned by port authorities, general fisheries inspectorate, and any other public entity that is entitled to perform non-commercial activities at sea, under its organic law. This categorization can be extended to unmanned vessels.

Portuguese State vessels owned by the Navy, by AMN, by the police forces and by the civil protection services are not subject to registration.³⁹⁴ There is no reason to apply a different regime to unmanned vessels that might be owned by the same public entities. In any case, these unmanned vessels shall comply with the remaining requirement, notably regarding their proper identification as a Portuguese State vessel, in order to be identified as such while navigating on the high seas.

Decree-Law No.193/81, of 8 July,³⁹⁵ defines the status of auxiliary units that support Navy operations. This legal instrument does not provide any definition for these crafts but rather establishes that auxiliary units are those navy units that due to their characteristics are not considered naval units.³⁹⁶ It seems then that any unmanned auxiliary unit that is used by the Portuguese Navy falls within the scope of this Decree-Law. Nevertheless, the authority that the Portuguese officials exercise over the State vessels shall be discussed when it comes to unmanned State vessels. The Portuguese Navy, as well as the ANM, police forces and civil protection services are organized in a comprehensive structure regulated by their organic law and complementary legislation that establishes general principles and rules for their operations at sea. These include rules regarding the command of the vessel and the staff and crew involved. Therefore, it is relevant discussing rules for the distance-based commanders and crew and the authority that they will exercise over the official unmanned vessels.

2.2 Research vessels

Research vessels are a specific category of vessels³⁹⁷ defined in Portuguese law as mechanically propelled vessels aimed at conducting coastal or oceanic MSR, which

394 Article 2(3), Decree-Law No. 92/2018, of 13 November, which introduced a special tonnage tax regime in Portugal and also established new rules for the registration of vessels, available at <https://dre.pt/application/file/a/116931993>.

395 Decree-Law No. 193/81, of 8 July it defines the status of navy vessels and ships that are not considered naval units but auxiliary units that support Navy operations, available at <https://dre.pt/application/file/a/580476>; this legal instrument was amended by Decree-Law No. 377/85, of 26 September, available at <https://dre.pt/application/file/a/176962>; and by Decree-Law No. 105/2005, of 29 June, available at <https://dre.pt/application/file/a/233662>.

396 *Ibid.*, Article 1.

397 Article 19(2) Decree-Law No. 265/72, of 31 July (n 393).

are subject to the legal regime that is applicable to auxiliary vessels.³⁹⁸ Auxiliary vessels are, in turn, subject to the legal regime applicable to merchant vessels. This makes sense when research vessels are owned by private entities. Nevertheless, when MSR is carried out by public entities, such as the Navy, it can be argued that a public function is being performed. As a result, the research vessel shall be subject to legal regime referred in 2.1 above.

Unmanned vessels that carry out MSR shall be subject to the aforementioned regime. Consequently, when unmanned research vessel are operated by private entities they shall be subject to the legal regime of auxiliary vessels; when used to conduct MSR by public entities the legal regime of unmanned state vessels shall apply.

2.3 Merchant vessels

The General Regulation of Captaincies integrates into the category of merchant vessels the following vessels: commercial vessels, fishing vessels, tugboats and auxiliary vessels.³⁹⁹ These are vessels that, in principle, carry out any merchant activity. Merchant vessels are subject to different types of rules under Portuguese law, depending on the type of activity they perform. The Portuguese legal system also recognizes the existence of other floating devices,⁴⁰⁰ a term that is not defined and is likely to comprise several types of crafts, including UUVs.

2.3.1 Commercial vessels

Commercial vessels are vessels used for transporting people or goods even when they do not have propulsion and navigate pushed by tugboats.⁴⁰¹ Commercial vessels can also be subclassified considering the area they operate in,⁴⁰² and considering the nature of the transport they carry out.⁴⁰³ The concept of commercial vessels can perfectly accommodate unmanned commercial vessels since no requirement of manning is imposed by the national laws.

2.3.2 Fishing vessels

Fishing vessels are a specific category of merchant vessels that are subject to the specific legal regime provided for in Regulation No. 43/87, of 17 July that defines the

398 *Ibid.*, Article 23-A.

399 *Ibid.*, Article 19(2).

400 Article 16(1)(2), Law No. 34/2006, of 28 July (n 329).

401 Article 20 Decree-Law No. 265/72, of 31 July (n 392).

402 *Ibid.*, Article 25.

403 *Ibid.*, Article 33.

national measures for conservation of biological resources in fishing activities in internal waters, waters under national sovereignty or jurisdiction and in water beyond national sovereignty or jurisdiction.⁴⁰⁴ This legal framework does not define fishing vessel but it does have some technical requirements that shall be observed by all fishing vessels namely in terms of size, endurance, and equipment.⁴⁰⁵ Fishing vessels are also classified considering the area where they conduct fishing activities.⁴⁰⁶ It is likely that these requirements set forth in Article 66 to 60 of Regulation No. 43/87, of 17 July will also be imposed on unmanned fishing vessels.

Acquisition, construction, and modification of fishing vessels that are going to be or have already been registered in Portuguese ports are subject to previous authorization. Therefore, it is likely that construction of unmanned fishing vessels will also be subject to authorization.⁴⁰⁷ An authorization is imposed as well in cases of charter.⁴⁰⁸ Fishing is a commercial activity that requires a license. Several aspects are analyzed before the license is granted, notably the features and the state of the vessel itself.⁴⁰⁹ Hence, beyond the requirements that shall be observed by the unmanned vessels to be able to be admitted as fishing vessels, the activity itself needs to be approved and licensed.⁴¹⁰

2.3.3 Tugboats

Tugboats are mechanically propelled vessels aimed at conducting other vessels by using cables or any other non-permanent means.⁴¹¹ Tugboats can also be classified considering the area they operate in.⁴¹² Tugboats can be employed in several maritime activities, but when they are prepared to be used in the rescue of salvage of ships in distress, including the crew and the passengers, they are specifically called salvage tugs.

The definition of tugboat that is provided for by the national legislation does not impose that they shall be manned. Accordingly, in principle, the current legal framework may be applicable to unmanned tugboats. This rationale is supported by De-

404 Regulation (*Decreto Regulamentar*) No. 43/87, of 17 July, which establishes the legal regime of fisheries in waters under Portuguese sovereignty and jurisdiction as republished by Regulation (*Decreto Regulamentar*) No. 16/2015, of 16 September, available at <https://dre.pt/application/file/a/70311780>.

405 *Ibid.*, Article 66.

406 *Ibid.*, Article 62.

407 *Ibid.*, Article 70.

408 *Ibid.*, Article 72.

409 *Ibid.*, Article 74-A(c).

410 *Ibid.*, Article 74.

411 Article 23 Decree-Law No. 265/72, of 31 July (n 392).

412 *Ibid.*, Article 43.

cree-Law No. 431/86, of 30 December⁴¹³ that defines the rules for maritime towing contracts. Article 1 of this legal framework adopts a very wide definition of tugboat in order to comprise ships, vessels or any other similar device. As long as the vessel, ship or other floating device have conditions to navigate and have a propulsion system that enables towing and pushing, it can be used as a tugboat.⁴¹⁴ The same approach is adopted when defining those vessels that can be towed that include not only vessels and ships but also any other floating device.⁴¹⁵ It is also important to note that the Portuguese legislation permits that tugboats used in a contract are substituted or changed for another with suitable characteristics, provided that a communication to the other party is made.⁴¹⁶ Hence, it can be argued that if an unmanned vessel holds suitable characteristics to complete the service that a regular tugboat carries out and is able to tow and push the vessel to the place of its destination, they shall be legally accepted.⁴¹⁷

The exercise of any commercial activity with a tugboat is subject to a license.⁴¹⁸ Thus, it is expected that the performance of the activity by unmanned tugboats will also require licensing.

2.3.4 Auxiliary vessels

Auxiliary vessels are a residual category of vessels that are used in other activities rather than MSR, maritime towage, fishing, commercial or recreational activities. They can be mechanically propelled or not, and their designation is normally given considering the service they perform.⁴¹⁹ Auxiliary vessels can also be classified considering the area they operate in.⁴²⁰

An example that can be given of an auxiliary vessel is tourist vessels that are employed for maritime tourism activity under the legal regime set for in Decree-Law No. 149/2014, of 10 October.⁴²¹ This legal framework does not impose any re-

413 Decree-Law No. 431/86, of 30 December defines rules for maritime towing contracts, available at <https://dre.pt/application/file/a/210904>.

414 A V Böhm-Amolly, 'Reboque e Amarração de Navios' in M J da Costa Gomes (coord), *IV Jornadas de Lisboa de Direito Marítimo, O Porto*, (Almedina, Lisboa, 2018), 573-591, at p. 581.

415 *Ibid.*, at p. 580.

416 Article 12 Decree-Law No. 431/86, of 30 December (n 413)

417 *Ibid.*, Article 11(3).

418 Article 232 Decree-Law No. 265/72, of 31 July (n 392).

419 *Ibid.*, Article 24.

420 *Ibid.*, Article 43.

421 Decree-Law No. 149/2014, of 10 October approves the regulation for vessels used in maritime tourists' activities, available at <https://dre.pt/application/file/a/58247681>.

quirement for these vessels to be manned, but it does impose requirements on the crew, including regarding their registration.⁴²² When auxiliary vessels are technically prepared to fully operate without a crew on board, it is necessary to define how certification of distance-based crew will be carried out, as well as to define how the obligation of having documentation on board and to submit them to the maritime authorities will be observed.⁴²³

2.3.5 Recreational vessels

Recreational vessels are subject to the legal regime provided for in Decree-Law No. 124/2004, of 25 May⁴²⁴ that approves the Regulation of Recreational Navigation. Recreation vessel are defined as a device of any nature used or capable of being used as a means of movement on the surface of the water for water sports or simple pleasure.⁴²⁵ This is a very broad definition that is likely to include some unmanned recreational vessels (some recreational vessels such as sailing boat and rowboats necessarily require a human presence on board). Norms regarding the registration of recreational vessels as well as external markings can be easily observed by unmanned recreational vessels.

3. The entrance of unmanned foreign State vessels in waters under Portuguese sovereignty or jurisdiction

Decree-law No. 2/2017, of 6 January⁴²⁶ establishes the legal regime of the entrance of foreign warships, aircrafts and foreign land forces in Portuguese territory. This legal instrument adopts the same criteria as the UNCLOS while requesting the warship to be under the command of an official. An evolutionary interpretation of the Portuguese legal framework can be advanced as it was made regarding the UNCLOS. However, the national legislation normally imposes specific and concrete requirements that necessarily require an adaptation of standards to regulate unmanned vessels. Consequently, in principle, this legal framework needs to be amended for foreign unmanned State vessels to be allowed to enter into Portuguese territory. In any case,

422 *Ibid.*, Article 10.

423 *Ibid.*, Article 13(2).

424 Decree-Law No. 124/2004, of 25 May (n 79).

425 *Ibid.*, Article 2 of the Annex.

426 Decree-Law No. 2/2017, of 6 January approves the legal regime of the entrance of foreign warships, aircrafts and foreign land forces in the Portuguese territory, available at <https://dre.pt/application/file/a/105714586>.

this legal framework is a good example to mention because it has provisions that require amendments and others that are likely to be applicable to unmanned vessel.

For instance:

- Article 4 imposes that vessels shall comply with the domestic legislation in force and do not practice any act that may offend the fundamental principles of the Portuguese public order. It does seem feasible for unmanned vessels to comply with this disposition since this is not related to their unmanned nature;
- Foreign warships are entitled to enjoy the right of innocent passage. Nonetheless, when they want to access ports or to enter in national territory, several procedures shall be observed, notably authorization for entrance.⁴²⁷ If the right of innocent passage applies to unmanned warships, entrance in national territory requires information regarding the staff on board and the officials in charge of the vessel. Information regarding the type of unmanned vessels shall also be given.⁴²⁸ It can be argued that these requirements apply to distance or shore-based commanders and crew that are in charge of the warship, but a legal amendment needs to be introduced.⁴²⁹
- Article 19 grants to warships and their garrisons privileges and immunities set for in international law. There is no reason to exclude this rule to unmanned State vessels;
- Any underwater work is subject to the authorization of the Portuguese State, as imposed by Article 23(f). It can be argued this includes any underwater work carried out by submarines and by UUVs;
- Small vessels transported on board can only be launched and navigate when they are not armed.⁴³⁰ This rule shall also apply to small unmanned vessels that are transported on board of warships.

427 *Ibid.*, Articles 13 and 14.

428 *Ibid.*, Article 17(1)(a)(l).

429 *Ibid.*, Article 17(1)(f)(g)(h)(i).

430 *Ibid.*, Article 27.

Section 2

NATIONALITY, REGISTRATION, AND FLAGGING

1. Conventional Registry - BMAR

Portuguese law requires, in accordance with Article 94 of the UNCLOS that vessels shall be registered to be entitled to fly the Portuguese flag.⁴³¹ This obligation applies to any commercial vessel, fishing vessel, recreational vessels, tugboats, and research vessels, as well as to non-propelled vessels,⁴³² and it is independent of the license that may be imposed for the performance of any commercial or fishing activity.⁴³³

The obligation of registration does not apply to the following vessels:

- Portuguese State vessels owned by the Navy, by AMN, by the police forces and by the civil protection services.⁴³⁴
- Small vessels on board, even lifeboats, small auxiliary fishing vessels, small boats to be used on the beach, without engine or mainsail, such as *charutos* boats, inflatable boats, and pedal boats to be used up to 300 meters from the lower-water line along the coast that are not registered⁴³⁵ but shall be licensed by the maritime authority.⁴³⁶ This exception is very broad and may include USVs that are easily transported on board of large vessels.

The conventional Portuguese registry of ships and vessels was recently revised and a new National System for Vessels and Sailors was created.⁴³⁷ This legal framework establishes an electronic registration system for vessels and sailor known as 'BMAR'. This is an electronic central database aimed at facilitating online registration and consultation of data regarding vessels, sailors and other facts subject to registration that are related to the maritime activity.⁴³⁸ Information regarding vessel registration, vessel inspections, vessel certification, recreational sailing licenses, sailor registration and

431 Article 2(2) Decree-Law No. 92/2018, of 13 November (n 394).

432 Article 76 Decree-Law No. 265/72, of 31 July (n 392).

433 *Ibid.*, Article 72(3).

434 *Ibid.*, Article 72(1).

435 The UNCLOS enables the State to exclude from the duty of registration vessels which, on account of their small size, are excluded from generally accepted international regulations; see Article 94(2)(a) UNCLOS.

436 Article 77 Decree-Law No. 265/72, of 31 July (n 392).

437 Decree-Law No. 43/2018, of 18 June creates BMAR, available at <https://dre.pt/application/file/a/115526586>.

438 *Ibid.*, Article 1.

certification, and certified training entities are some examples of data that can be organized electronically.⁴³⁹ This legal framework was approved with the purpose to facilitating and accelerating the registration of vessels and to enable an online consultation of information. It eliminates the imposition of going to a port of registry in order to have a vessel registered, consequently reducing costs and simplifying the procedures. Decree-law No. 43/2018, of 18 June was complemented by Decree-Law No. 92/2018, of 13 November,⁴⁴⁰ which introduced a special tonnage tax regime in Portugal and also established new rules for the registration of vessels, in order to simply the procedures and promote online access to registration of vessels.

Both legal instruments recently approved have not introduced significant amendments to the substantive regime of registration: the facts regarding vessels that are subject to registration, as well as the type of vessels that shall be registered were not amended. Reference to the registration of unmanned vessels is not made.

The first registration of a vessel that is carried out in the public records is the acquisition or the construction of the vessel.⁴⁴¹ The registration shall be required by the shipowner or by any entity on the shipowner's behalf. For the registration to be accepted the documents set forth in Article 13 of Decree-Law No. 92/2018, of 13 November shall be presented. Requirements and documents to proceed with provisional registration⁴⁴² cancellation,⁴⁴³ and transfer of registration⁴⁴⁴ are also regulated in Decree-Law No. 92/2018, of 13 November.

In the near future, it will be important to discuss the information regarding unmanned vessels that shall be given for their registration, notably regarding the technology employed for distance navigation, information regarding the activation of safety procedures in case of emergency, information regarding distance-based master and crew, and other relevant data.

439 *Ibid.* Article 7.

440 Decree-Law No. 92/2018, of 13 November (n 394).

441 See Article 12 Decree Law No. 42644 of 14 November 1959; this is a very old legal framework that was partially repealed; however, when it comes to defining the facts of vessels that are subject to registration Article 4 still applies; moreover, Articles 5, 9 and 12 are also in force; see Decree-Law No. 42644, of 14 November 1959 that approves the Land Registration Code, available at <https://dre.pt/application/file/a/438874>; this Decree-Law was amended by Decree-Law No. 290/84, of 27 August, available at <https://dre.pt/application/file/a/381015> accessed on 20 June 2018; and by Decree-Law No. 403/86, of 3 December, available at <https://dre.pt/application/file/a/221460>.

442 Article 16 Decree-law No. 92/2018, of 13 November (n 394).

443 *Ibid.*, Article 19.

444 *Ibid.*, Article 20.

2. International Registry - MAR

Madeira's International Shipping Registry (MAR)⁴⁴⁵ integrates the International Business Centre of Madeira⁴⁴⁶ also known as Madeira free trade zone. It was created in 1989 as a credible and competitive international registry with access to Portugal's continental and islands cabotage within the framework of the EU. It offers a very competitive tax regime to vessels, shipping companies, and crew, and complies with all ILO and IMO maritime conventions.

MAR is the Portuguese international registry that provides registration for all acts and contracts related to vessels as well as ensures compliances with the safety standards as required by the Portuguese authorities. Among its responsibilities are the inspection of ships, providing names and number of the registration for vessels, issuing the vessel certificate, registering the crew, among others.⁴⁴⁷

Commercial ships and recreational vessels⁴⁴⁸ operating in the marine environment, including fixed or floating platforms, auxiliary vessels and tugboats are included in the concept of ship and, accordingly, can be registered in MAR.⁴⁴⁹ Once the registration is completed in accordance with the legal procedures imposed, vessels are entitled to use the Portuguese flag.⁴⁵⁰ Complementary regulations were approved by Order No. 715/89, of 23 of August⁴⁵¹ that defines the procedures for the registration of vessels.

Neither Decree-Law No. 96/89, of 28 March as republished by Decree-Law No. 234/2015, of 13 October nor the aforementioned Order makes any reference to the registration of unmanned vessels. Nevertheless, it seems that MAR can, in theory, enable the registration of unmanned vessels, since the definition of ship provided as any commercial or recreational craft operating in the marine environment including fixed or floating platforms, auxiliary vessel, and tugboats,⁴⁵² is very broad and does not impose

445 Decree-Law No. 96/89, of 28 March, republished by Decree-Law No. 234/2015, of 13 October, which creates the Madeira's International Shipping Registry, available at <https://dre.pt/application/file/a/70641529>.

446 Article 146(1)(d) EPARAM (n 355).

447 Article 3 Decree-Law No. 96/89, of 28 March (n 445).

448 Decree-Law No. 192/2003, of 22 August that regulates the registration of recreational vessels in MAR, available at <https://dre.pt/application/file/a/656027>.

449 Article 5(e), Decree-Law No. 96/89, of 28 March (n 445).

450 *Ibid.*, Article 6(2).

451 Order (*Portaria*) No. 715/89, of 23 of August, establishes regulations for shipping registration in MAR, available at <https://dre.pt/application/file/a/618419>; as amended by Decree-Law No. 23/2007, of 1 February, available at <https://dre.pt/application/file/a/518293>.

452 Article 5(e), Decree-Law No. 96/89, of 28 March (n 445).

the requirement of manning. When it comes to the documents to be submitted, as it has already been asserted, it is important to discuss the information regarding unmanned vessels that shall be provided for the registration of unmanned vessels in MAR.

3. Identification, marking and certification

Vessels registered in Portugal shall be properly identified by having specific information and marking, such as the acronym 'PT', the number of the registration, name of the vessel, and the letter that identifies the type of vessel.⁴⁵³

The requirements of marking imposed by Decree-law No. 92/2018, of 13 November will be complemented by new regulations to be passed in a near future.⁴⁵⁴ Meanwhile, other legal instruments are already in force and also impose rules on markings, such as Decree-Law No. 295/94, of 16 November⁴⁵⁵ that created the IMO number for the identification of vessels and Order No. 715/89, of 23 August⁴⁵⁶ that regulated registration of vessels under the Madeira International Registry.

The aforementioned legal frameworks were prepared to identify regular vessels, but an analysis of their dispositions facilitates the identification of some common signals that can be used to mark and identify unmanned vessels as well. The current signals that are mandatory to regular vessels can be observed by unmanned vessels, as following:⁴⁵⁷

- Name of the unmanned vessel;
- Registration number;
- Letters indicating the type of vessel;
- Indication of tonnage.

It can be discussed whether or not unmanned vessels shall have an internationally signal aimed at representing the unmanned nature of the craft. It is a fact

453 Article 12 Decree-law No. 92/2018, of 13 November (n 394).

454 *Ibid.*, Article 12(3).

455 Decree-Law No. 295/94, of 16 November, which creates the IMO number for identification of vessels, available at <https://dre.pt/application/file/a/534509>.

456 See Article 10 Order (*Portaria*) No. 715/89, of 23 August (n 451).

457 Chapter VI, Decree-Law No. 265/72, of 31 July (n 392).

that unmanned vessels are still being developed, but some images released by some companies working in the area, demonstrate that unmanned vessels are clearly identified as such and can be distinguished from regular vessels due to their characteristics.⁴⁵⁸ Nevertheless, if different types of unmanned vessels are going to be developed it seems that internationally agreed marking signals may contribute to facilitate the identification of unmanned vessels and to avoid incidents at sea.

Portuguese domestic legislation may determine special identification characters for unmanned vessels, and within the category of unmanned vessels may established sub-specifications considering the area where the unmanned vessel is going to operate, the commercial activity to be performed, the extent of the autonomy, or any other feature that may justify special identification. Markings shall be legible and be permanently maintained, as well as painted in a color that contrasts with the color of the hull. The law imposes as well that letters shall be at least one decimeter high and have a proportional width,⁴⁵⁹ in order to be legible at distance.

Before the authorities released the documents for a vessel to legally operate under Portuguese jurisdiction several certificates shall be issued upon previous inspections being carried out.⁴⁶⁰ These are mainly certificates for the safety of navigation and the prevention of pollution that shall be issued in accordance with several international convention. Certificates to be granted to vessels are very much dependent on the type of the vessel, the size and the activity to be performed and, despite being enacted by national authorities, they reflect and attest that the vessel complies with international standards. Nonetheless, what it seems to be relevant to discuss in a proper technical forum, are the technical requirement that shall be in place for a certificate to be enacted by the Portuguese authorities.

458 See for instance <https://phys.org/news/2017-09-unmanned-ships-cargo-industry-dearly.html>; <https://www.sintef.no/en/latest-news/test-site-opens-for-unmanned-vessels/>.

459 Article 111 Decree-Law No. 265/72, of 31 July (n 392); Article 32(2) Decree-law No. 92/2018, of 13 November (n 394).

460 See for instance Decree-Law No.13/2012, of 20 January, which establishes measures to be observed by the Portuguese State in relation to organizations in charge of inspection, survey and certification of ships, available at <https://dre.pt/application/file/a/544213>; see also Article 4 Order (*Portaria*) No. 715/89, of 15 August (n 451), and Articles 14 and 18 Decree-law No. 92/2018, of 13 November (n 394).

Section 3

NAVIGATION OF UNMANNED VESSELS IN WATERS UNDER PORTUGUESE SOVEREIGNTY AND JURISDICTION: LEGAL CHALLENGES

1. Regulations regarding crewing and documentation

The development and operation of unmanned vessels will have a tremendous impact on the maritime labour industry. Not only crew and masters will start operating vessels onshore but also some unmanned vessels might eventually be preprogrammed and operate entirely ‘commanded’ by machines. The labour market needs to be adapted and, consequently, labour regulations shall be amended. This adaptation will be operated not only at the international level but mainly at the national level. As prescribed by the UNCLOS it is up to the States to take measures to ensure that *‘each ship is in the charge of a master and officers who possess appropriate qualifications, in particular in seamanship, navigation, communications and marine engineering, and that the crew is appropriate in qualification and numbers for the type, size, machinery and equipment of the ship;’*⁴⁶¹ and that *‘the master, officers and, to the extent appropriate, the crew are fully conversant with and required to observe the applicable international regulations concerning the safety of life at sea, the prevention of collisions, the prevention, reduction and control of marine pollution, and the maintenance of communications by radio.’*⁴⁶²

Traditionally, the master of a vessel is a natural person that exercises authority over such a vessel and is responsible for the persons on board and the cargo transported. In addition, the master also exercises several duties imposed by international conventions, such as the duty to render assistance to other vessels in distress.⁴⁶³ Consequently, in order to fully regulate the operation of unmanned vessels with different levels of autonomy in the Portuguese legal order, it is necessary to discuss how labour conditions will work. Amendments to the current legislation in place can be made or, alternatively, a new comprehensive legal framework can be adopted that regulates labour requirements and conditions for distance-based masters and crew.

For the future, the legislation that will regulate crewing shall have to consider several technical aspects, which require discussions, such as:

⁴⁶¹ Article 94(4)(b) UNCLOS.

⁴⁶² *Ibid.*, Article 94(4)(c).

⁴⁶³ *Ibid.*, Article 98.

- The level of autonomy of the vessel and its capacity to take decisions or merely to be remotely controlled. The duties and the obligations of the master, crew, and operators will certainly depend on the type of vehicles being remotely controlled;
- The type of technology involved to enable distance-based masters and crew to control the unmanned vessel;
- The qualifications and training of the distance-based masters and operators of the vessel;
- The responsibilities of the distance-based master and operators;
- Safety, occupation and health-related issues.

Alongside with the regulations regarding crewing, Portuguese legislation requires the commercial vessels flying the Portuguese flag to maintain several documents on board, such as the registration document of the vessel, seaworthiness certificate, ship's log, as well as any other document, as imposed by international law.⁴⁶⁴ These documents shall be held by the master or by the person that is responsible for the craft, and legally in charge to present them to the authorities upon request.⁴⁶⁵ Non-compliance with this obligation is an administrative offence, which may result in the payment of an administrative fine between 25,00 to 500,00 euros.⁴⁶⁶

The documents that shall be kept on board are listed in Article 121 of Decree-Law No. 265/72, of 31 July. This provision has not been updated. Several other obligations are required as a result of some international conventions ratified by Portugal. In any case, the law requires for the documents to be held by the master or by the person in charge of the safety of the vessel, since they shall be presented, notably when requested by a warship, by the maritime authority or even to prove the nationality of the vessel on the high seas.⁴⁶⁷ More dramatically is the application of Article 154 of Decree-Law No. 265/72, of 31 July that enables the maritime administration, in certain circumstances, to retain the documents of the vessel. This can only be done in practice if the documents inspected are the original ones. Therefore, it

⁴⁶⁴ Article 121 Decree-Law No. 265/72, of 31 July (n 392).

⁴⁶⁵ *Ibid.*, Article 149.

⁴⁶⁶ Article 4(3)(e) Decree-Law No. 45/2002, of 2 March, as amended by Decree-Law No. 180/2004, of 27 July, and by Decree-Law No. 263/2009, of 28 September, which defines the legal regime applicable to maritime fines under the jurisdiction of the AMN; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1694&tabela=leis.

⁴⁶⁷ Article 150 Decree-Law No. 265/72, of 31 July (n 392).

is important to discuss how unmanned vessels are going to have the documents on board or, alternatively, if this obligation can be observed by using an electronic system, as it is suggested by Article 18(2) of Decree-Law No. 92/2018, of 13 November, which refers to the association of a vessel's document to an electronic system.

2. Liability for damages caused by foreign flagged unmanned vessels in case of collision in waters under Portuguese sovereignty and jurisdiction

The liability regime in case of collision of foreign unmanned vessels⁴⁶⁸ in waters under Portuguese sovereignty or jurisdiction is subject to three international conventions:

- **The 1910 International Convention for the Unification of Certain Rules of Law with Respect to Collision Between Vessels, also known as Brussels Collision Convention**⁴⁶⁹ - The definition of vessel is not given in this Convention, which specifies the rules for payment of compensation due to damages arising from a collision between sea-going vessels or between seagoing vessels and vessels of inland navigation in whatever waters the collision takes place. The scope of this Convention covers damages caused either by the execution or non-execution of a manoeuvre or by the non-observance of the regulations even if no collision had actually taken place,⁴⁷⁰ caused to the vessels or to any things or persons on board that may be affected by the marine incident.⁴⁷¹ In a concrete case, only those damages effectively suffered shall be compensated. It seems that the fact that an unmanned vessel is deprived of a crew and a master does not mean that this convention does not apply. It applies but only for damages caused to the vessel itself and eventually to things on board.
- **The International Convention for the Unification of Certain Rules concerning Civil Jurisdiction in Matters of Collision**⁴⁷² - Since vessel is not defined in the text of the Convention, its jurisdiction is not, in principle, affected by

468 These conventions do not apply to warships nor to government ships operated for non-commercial purposes and are aimed at defining rules for collision in case of merchant vessels are involved.

469 International Convention for the Unification of Certain Rules of Law with Respect to Collision Between Vessels (Brussels 23, September 1910, in force 1 March 1913), available at <http://www.admiraltylawguide.com/conven/collisions1910.html>. Portugal was one of the State member negotiating this Convention and is a State party since 25 December 1913.

470 *Ibid.*, Article 13.

471 *Ibid.*, Article 1.

472 International Convention for the Unification of Certain Rules concerning Civil Jurisdiction in Matters of Collision (Brussels, 10 May 1952, in force 14 September 1955); in Portugal, see Decree-Law No. 41007, 16 February 1957, available at <https://dre.pt/application/file/652986>.

the unmanned nature of the vessel. The liability imposed by the Convention applies in cases where the collision is caused by the fault of a master.⁴⁷³

- **The International Convention for the Unification of Certain Rules concerning Penal Jurisdiction in Matters of Collision**⁴⁷⁴ - The Convention does not define vessel and is applicable when penal or disciplinary liability of the master or of any other person in service of the ship is at stake.⁴⁷⁵ The Convention determines that this assessment is made in accordance with the laws and regulations of the flag State and grants the jurisdiction of the State to assert its jurisdiction over its nationals.⁴⁷⁶ States shall discuss whether or not to maintain jurisdiction over shore-based masters and crew that are not their nationals.

3. Liability for damages caused in case of collision of Portuguese flagged unmanned vessels

Collision involving two or more vessels flagged with the Portuguese flag regardless of the maritime area where the incident occurs is subject to Portuguese laws. Collision is not defined but Decree-Law No. 384/99, of 23 September, which establishes the legal regime regarding a ship's crew,⁴⁷⁷ defines 'sea event'. Sea event is any extraordinary occurrence happening at sea or in waters under national jurisdiction, which has caused, or is likely to cause damage to ships, floating devices, persons or things being transported. This includes storms, shipwreck, stranding, collision capture, arrest, piracy, robbery, gross breakdowns, as well as other accident at sea and other acts set forth in Article 13 of the aforementioned legal framework.

Liability for collision is regulated in the Commercial Code,⁴⁷⁸ complemented by ordinary legislation,⁴⁷⁹ and by some dispositions of the Civil Code (CC).⁴⁸⁰ The Commercial

473 *Ibid.*, Article 4.

474 International Convention for the Unification of Certain Rules concerning Penal Jurisdiction in Matters of Collision (Brussels, 10 May 1952, in force 20 November 1955); in Portugal, see Decree-Law No. 41007, 16 February 1957, available at <https://dre.pt/application/file/652986>.

475 *Ibid.*, Article 1.

476 *Ibid.*, Article 3.

477 Decree-Law No. 384/99, of 23 September approves the legal regime regarding ship's crew, available at <https://dre.pt/application/file/a/556173>.

478 Portuguese Commercial Code, Letter of Law of 28 June 1888, available at http://www.pedrosoleal.com/estatutos_pdf/comercial/codigo_comercial.pdf. Most of the provisions of the Commercial Code were already repealed, however, some parts regarding maritime issues are still in force.

479 See, for instance, Decree-Law No. 202/98, of 19 July (n 388).

480 Portuguese Civil Code, Decree-Law No. 47344/66, of 25 November, was amended several times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdllisboa.pt/leis/lei_mostra_articulado.php?nid=775&tabela=leis.

Code establishes, from Article 664 to Article 675, a fault-based liability regime that determines the liability for payment of compensation in four different types of collision:

- **Collision caused by one ship** – compensation shall be paid by the default vessel;⁴⁸¹
- **Collision caused by both ships** – compensation shall be paid by each vessel in accordance with the proportion of the severity of the fault of each vessel;⁴⁸²
- **Collision without fault** - caused by force majeure, where there is no entitlement to receive any compensation;⁴⁸³
- **Collision in case of doubt** – compensation shall be paid by both vessels. However, in the case of damages caused to cargo and persons all vessels involved are liable.⁴⁸⁴

The rules of the Commercial Code above mentioned do not make any reference to the manned or unmanned nature of the ship involved in the collision, which support the argument that it applies, in theory, to maritime collisions involving unmanned vessel. Nevertheless, the relevance of the unmanned nature of the vessel can be seen during the analysis of the legal regime provided for in Decree-Law No. 202/98, of 19 Jul, which regulates the liability regime of ship owners and considering the CC general dispositions on civil liability that complement the Commercial Code, mainly in three key aspects: *i)* in the division of liability between the shipowner and the distance-based master; *ii)* in the evaluation of the unlawful conduct carried out by the unmanned vessel; and *iii)* in the consideration of the navigation of unmanned vessels as a dangerous activity.

3.1 The division of liability between the shipowner and the distance-based master

The aforementioned provisions of the Commercial Code only determine which vessel shall be liable for the payment of the compensation in case of collision. However, the liability of the vessel at fault before third parties, which is borne by the shipowner,⁴⁸⁵ does not prejudice the liability of those who are actually responsible for the collision,

481 Article 665, Commercial Code (478).

482 *Ibid.*, Article 666.

483 *Ibid.*, Article 664.

484 *Ibid.*, Article 668.

485 The liability of the shipowner is established by default. See Article 4 Decree-Law No. 202/98, of 19 July (n 388).

such as the master and the pilot.⁴⁸⁶ Therefore, externally, to third parties, the shipowner is liable for any damage caused, even when the damage is a result of an unlawful act of the master and the pilot, as clearly defined in the law.⁴⁸⁷ Nonetheless, internally, in the relationship between the shipowner and the master, it is necessary to assess who is truly liable for the collision, in accordance with Article 500 of the CC.⁴⁸⁸

Article 500 of the CC regulates, in general, the liability that individuals hold when they use others to perform their responsibilities, and make them liable for the acts and damages they may cause to third parties. Under this regime, the shipowners can be liable for the acts and damages caused by masters and pilots, even when they are remotely in charge of the vessel.

The idea of this provision is to ensure that third parties affected notably third vessels, unmanned vessels, floating devices, artificial islands, etc, are duly compensated by the owner of the craft that caused the collision. The liability of the shipowner is a strict liability since it exists even when the shipowner has no fault.⁴⁸⁹ This does not prejudice the right that the shipowner holds to be reimbursed by those who were actually liable for the collision, if the requirements of Article 500 of the CC are observed, as such:

- A commission must exist between the shipowner and the distance-based master. A commission is understood as any service of any nature that one person carries out under the direction of another person. Distance-based masters will be, in principle, acting under the direction of the owner of the vessel, since the order indicating the destination of the unmanned vessels is defined by the owner;
- In addition, the service that is undertaken shall be done in the interest of the entity who exercises direction; and damages caused shall be produced in the exercise of his or her functions. This requirement does not raise any problems, unless the damages are caused by the distance-based master outside the scope of her or his functions. For this reason, the existence of a detailed job description that apply to the distance-based master is very relevant;⁴⁹⁰

486 Article 671 and 672, Commercial Code (n 478).

487 Article 4(1)(a), (b) Decree-Law No. 202/98, of 10 July (n 388); see also L M Leitão, *Direito das Obrigações, Vol I, Introdução da Constituição das Obrigações*, (7.ª ed. Almedina, Coimbra, 2008), at p. 387.

488 *Ibid.*, Article 4(2).

489 Article 500(1), CC (n 480).

490 *Ibid.*, Article 500(2).

- It is also necessary that the distance-based operator is liable too, notably under the regime of fault liability, provided for in Article 483 of the CC, as it will be explained further in this report.

3.2 The evaluation of the unlawful conduct carried out by the unmanned vessel

The Commercial Code determines the substantive rules that regulate payment of compensation in case of collision. However, in order to concretely have a certain vessel liable the requirements of Article 483 of the CC shall be observed, particularly the verification of an action or an omission that results in an unlawful conduct. Unlawful conduct can take two forms: the violation of a right of another person and/or the violation of legal provisions that are aimed at protecting interests of others.

The violation of a right of another person means that the liability only exists when someone's rights are somehow offended. This includes the violation of the right to property or any other fundamental right. As long as a person's right is violated the instrument that caused such violation, such as an unnamed vessel or a regular vessel, is irrelevant.

In the assessment of the liability of unmanned vessels it is more important to discuss the unlawful conduct though violation of legal provisions aimed at protecting the interests of the others, particularly, the duty of care and good seamanship, the violation of which is likely to suffice for the purpose of Article 483 of the CC.

Duty of care and good seamanship is a fundamental principle in maritime law that requires that those in charge of a vessel have the ordinary capacity to exercise it and to respond to exceptional circumstances that may occur during a voyage, including those regarding the limitations of the vessels involved. Duty of care and good seamanship is also codified at the national level.⁴⁹¹ The violation of these duties is a matter of fact that needs to be assessed on a case-by-case basis. Yet, there are no doubts that the purpose of the norm that codifies these duties is to protect the interest of other vessels navigating at sea, as well as the ocean itself.

The question that follows next is whether or not the duty of care and good seamanship do apply to unmanned vessels and, how they shall bind distance-based masters and crew. As a matter of principle, there is no reason to exclude their application to unmanned vessels. However, as a matter of fact, certainly, the way these prin-

⁴⁹¹ Article 5(3) of the Decree-Law No. 384/99, of 23 September (477).

ciples will be observed by unmanned vessels and ensured by distance-based masters need to be elaborated. It may be relevant that guidelines and manuals are developed by the industry to densify the concept of the duty of care and good seamanship to provide some rules that may facilitate evaluation of the situation in case of collision, and the definition of the liability regime in cases where unmanned vessels are involved. In a universe where regular vessels navigate along with unmanned vessels, floating devices, artificial islands, etc, which may actually have different types of autonomy, the densification of such a concept may contribute to avoiding situations of collision as well as to facilitating clarification in case of non-compliance.

Once the unlawful conduct exists, it is necessary to assess the remaining requirements imposed by Article 483 of the CC, notably the fault or negligence of the distance-based master, the damages produced and the linkage or connection between the unlawful conduct and the damaged produced. These requirements shall impose no special treatment in case of unmanned vessels.

An important note shall be made regarding the burden of proof. In general, those who have suffered damages have to make prove that the requirements of Article 483 of the CC are in place. Parties failing to make such proof before courts are not entitled to receive any compensation, unless the reversal of the burden of proof applies, which can be in a case of dangerous activities.

3.3 The consideration of the navigation of unmanned vessels as a dangerous activity

Article 493(2) of the CC determines that those causing damages to third parties as a result of carrying out a dangerous activity shall compensate the victim, unless they prove that they had employed the due diligence imposed by the situation to prevent the damage. Dangerous activities are, for this purpose, those activities that by their nature or by the means employed, may cause or are likely to cause more damages than other general activities, in accordance with the circumstances of the case. Technical discussions shall be held to conclude whether or not the use of unmanned vessels in the marine environment shall be considered a dangerous activity under the scope of this provision. This is relevant, because Article 493(2) of the CC sets forth a presumption of guilt and imposes that those who carry out a dangerous activity shall compensate third parties for damages incurred unless it is demonstrated that all diligences required under the circumstances to avoid the damage were undertaken.

4. Maritime insurance

The assessment of liability regime for damages caused by unmanned vessels would not be completed without reference to maritime insurance. Although 75% to 96% of maritime accidents are a consequence of human error,⁴⁹² the emergence of unmanned vessels does not automatically mean that marine accidents will be reduced in such percentage.

Human factor will continue to play an important role in navigation and maneuvering of unmanned vessels but in a different way. The lack of persons on board is substituted by those working on land and among these, operators may have different roles and functions. On the top of this, an additional factor is to be considered: the technology itself.

In the Portuguese legal system, it is the Commercial Code that establishes between Article 595 and 615 the special legal regime that applies to marine insurance. The Commercial Code regulates the formal requirements that shall be observed for the insurance contract to be valid, stipulating, for instance, that the name of the captain must be included in the contract,⁴⁹³ it determines the extent of the object of the insurance contract,⁴⁹⁴ its duration⁴⁹⁵ and the beginning and the termination of the perils.⁴⁹⁶ The Commercial Code also sets forth rules regarding the value of the cargo and the things to be subject to the insurance contract,⁴⁹⁷ as well as provisions regulating the execution of the contract, including those regarding the perils,⁴⁹⁸ and in case of route changing⁴⁹⁹ or when the voyage is extended or reduced.⁵⁰⁰ When maritime insurance is aimed at covering transportation of goods, section IV (Article 155 to 160) of Decree-Law No. 72/2008, of 16 April also applies.⁵⁰¹

492 See, the *AGCS Safety & Shipping Review 2018*, at p. 18, available at <https://www.agcs.allianz.com/content/dam/onemarketing/agcs/agcs/reports/AGCS-Safety-Shipping-Review-2018.pdf>.

493 Article 596, Commercial Code (n 478).

494 *Ibid.*, Article 597.

495 *Ibid.*, Article 598.

496 *Ibid.*, Article 602.

497 *Ibid.*, Articles 599 to 601.

498 *Ibid.*, Article 604.

499 *Ibid.*, Article 608.

500 *Ibid.*, Article 612.

501 Decree-Law No. 72/2008, of 16 April, as amended by Law No. 147/2015, of 9 September approves the legal regime for insurance contract; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?artigo_id=2657A0076&nid=2657&tabela=leis&pagina=1&ficha=1&so_miolo=&nversao=.

In theory, the Commercial Code dispositions regarding maritime insurance can be applicable to contracts over unmanned vessels. However, the specific dangers that can be covered by the contract need to be discussed. Article 604 of the Commercial Code provides a list of the perils for which the insurance company is liable, such as all the damages arising from storm, wreckage, grounding, collision, forced change of route, travel or ship, from dumping, fire, unlawful violence, explosion, flood, plunder, supervenient quarantine, and, in general, by all other sea fortunes.⁵⁰² From the analysis of this provision it can be concluded that there is no reference to special perils that may exist as a result of the unmanned nature of the vessel.

Without having a complete picture on how unmanned vessels will operate, notably regarding the technical requirements for certifications based on the type of the vessel and their functions, and the way they will be controlled either shore-based or pre-programmed with predefined route, it is very premature to provide a full assessment of the perils that shall be mandatorily covered by marine insurance. At this first stage, some expected perils, specifically related to the operations of unmanned vessels can be put forward, namely:

- **Technological peril**- this includes information leaking, software failures, cyber-attack, as well as any other technological problems that may interfere, corrupt or break either the remote control that the shore-based operator is in charge of or involuntary changes to the pre-programmed route;
- **Technical and mechanical malfunctions**- this includes any technical problem that the unmanned vessel may suffer that is likely to interfere with the voyage and require immediate human intervention;
- **System failure**- due to a fire or any other problem with the vessel itself that affect the navigational system or the communications network;
- **Perils arising from collision**- it is possible that the perils of collision can be avoided with the aid of technology, but this is still a peril that will require coverage.

Until the legislation is amended, owners of unmanned vessels shall require marine insurance companies to prepare insurance contracts that specifically cover the aforementioned perils or any other that may be identified as relevant. If such perils are not covered by the insurance contract, the insurance company has good

⁵⁰² This does not exclude the possibility of the insurance company to exclude its liability in certain cases, based on a law or a clause of the marine contract, as a result of the nature of the things involved.

grounds for refusing payment of any compensation related to them. This happens because in the current Portuguese jurisdiction, in principle, maritime insurance only covers sea-related perils,⁵⁰³ and those will probably occur on land or be related to an event happening on land. If the Commercial Code is not amended the parties (the owner and the insurance company) need to properly assess the perils and include very detailed clauses on the contract that establishes a list of perils that are to be covered by the insurance.

The assessment of the fault of the master is also relevant in the case of insurance. Article 604(1) of the Commercial Code excludes the liability of the insurance company when the damages are caused by '*barataria*,' which is an act of the master, with fault or negligence that constitutes a violation of his/her duty of care.⁵⁰⁴ When damages are caused as a result of this, the insurance company is liable only when an express clause in the insurance contract so provides.⁵⁰⁵ In case of unmanned vessels remotely-controlled by a master that is not on board of the vessel but is totally in control of the craft by technological means it seems that the liability of the master can be, in theory maintain. Nonetheless, in practice, it is hard to see how it can be proved that the distance-based master acted in violation of his /her duty of care unless a clear code of conduct applies. Unmanned vessels totally preprogrammed without having a distance-based master that control their route, shall be subject to a clear and specific framework that regulates failures of technology.

Besides the Commercial Code, there are many other laws regarding insurance that regulate precise perils regarding maritime activity.⁵⁰⁶ These legal instruments cover specific areas that require a detailed treatment, as may be the case of unmanned vessels. Therefore, instead of introducing amendments to the Commercial Code, a new legislation may be prepared that only regulates insurance of unmanned vessels. This legal framework may be able to regulate insurance to different types of unmanned vessels, considering the perils involved and the activities to be performed, as well as the liability of the distance-based master.

503 F R Rocha, 'Seguros e Actividade Portuária' in M J da Costa Gomes (coord), *IV Jornadas de Lisboa de Direito Marítimo, O Porto*, (Almedina, Lisboa 2018) 202-294, at p. 212.

504 It is assumed that '*barataria*' includes both fault and negligence of the captain, but scholars have different positions about this. See, *Ibid.*

505 See the Portuguese Supreme Court Decision, Process 03A2827, (27/1/2004) that addresses '*barataria*' available at <http://www.dgsi.pt/jstj.nsf/954f0ce6ad9dd8b980256b5f003fa814/cf4c4c5d5ca773c980256e4e0040626b?OpenDocument>.

506 A detailed list of such legislation can be found at Rocha (n 503), at p. 209.

Chapter 3

THE NATIONAL REGIME APLICABLE TO UUVs USED FOR MSR

Section 1

THE REGIME OF MSR

1. The legal regime of MSR in waters under Portuguese sovereignty and jurisdiction

The importance of pure MSR as well as applied MSR has been expanding globally. At the national level, pure and applied MSR is also at the top of the Government's agenda. The importance of scientific research over the oceans, along with the adoption of a holistic and systemic approach to space, atmosphere, and climate was recently recognized in the Florianopolis Declaration signed on 20 November 2017,⁵⁰⁷ which launched the Atlantic International Research Centre based in Azores (Air Center). This is a platform aimed at expanding knowledge and promoting scientific and technological collaboration between the public and private sectors in the areas of climate, land, space, and oceans.⁵⁰⁸ In terms of applied research, having informa-

507 Florianopolis Declaration, *Establishing the Atlantic International Research Center*, (Florianopolis, Brazil, 2017), available at http://www.atlanticinteractions.org/wp-content/uploads/2017/12/Florianopolisdeclaration_23nov2017.pdf.

508 For more information on the AIR Center, see the Portuguese Foundation for Science and Technology, *Atlantic Interactions, A Science and Technology Agenda for an Integrative Approach to the Atlantic – Integrating Space, Climate, Oceans and Data Science Through North-South South-North Cooperation* (Portugal, August, 2017), available at https://www.bsc.es/sites/default/files/public/about/news/air-white_paper-july-2017_vf_bom_0.pdf.

tion, data and knowledge of the living and nonliving resources in areas under the Portuguese sovereignty or jurisdiction is an asset with an important economic value. Studies have demonstrated that in the Portuguese EEZ and continental shelf there is huge potential in terms of living and nonliving resources, such as hydrothermal vents and polymetallic nodules, which have already been identified.

The importance of knowledge of the oceans is also evident in the efforts that Portugal has made during several years to complete the submissions to CLSC for the purpose of extending the outer limits of the continental shelf. The relevance of MSR to Portugal is also demonstrated by a number of countries such as German, Spain, France and the United Kingdom that conducted MSR in waters under Portuguese sovereignty or jurisdiction.⁵⁰⁹ The National Ocean Strategy 2013-2020, which dictates a development model for oceans and coastal areas to support the promotion, growth, and competitiveness of the Portuguese maritime economy, also emphasizes the importance of research to support blue growth, and to increase the knowledge of the ocean.⁵¹⁰

Portugal, as coastal State, is entitled to legislate, in accordance with Part XIII of the UNCLOS⁵¹¹ not only regarding the procedural rules for the authorization of MSR projects but also regarding substantive rules regulating MSR in the territorial sea, in the EEZ and on the continental shelf.

The legal regime that regulates pure MSR in waters under Portuguese sovereignty or jurisdiction is different and mainly depends on whether the MSR project requires or not the exclusive reservation of a certain area of the marine environment.

Applied MSR is regulated separately in the legislation of the commercial activity to which MSR relates.

2. Pure MSR projects that do not require the exclusive reservation of an area of the marine environment

Pure MSR projects carried out in waters under Portuguese sovereignty or jurisdiction that do not require the exclusive reservation of a certain area of the marine environ-

509 For more information on the value and the importance of natural resources in Portuguese waters, see J C V F da Silva, 'Os cruzeiros de investigação científica estrangeiros nas zonas marítimas sob soberania ou jurisdição Portuguesa' 2015 Vol III (1) *Revista de Ciências Militares*, at pp. 241-267.

510 The Portuguese National Ocean Strategy 2013-2020 (16 November 2013), available at <https://www.cbd.int/doc/meetings/mar/mcbem-2014-04/other/mcbem-2014-04-pt-strategy-2013-2020-en.pdf>; accessed 16 May 2018; see also the Council of Ministers Resolution No. 12/2014, of 12 February, available at <https://dre.pt/application/file/a/572517>.

511 Huh and Nishimoto 'Article 246' (n 184), at p. 1646.

ment are regulated in Decree-Law No. 52/85, of 1 March, which lays down provisions on the exercise of activities in the national EEZ.⁵¹² This legal framework was repealed by Law No. 278/87, of 7 July.⁵¹³ However, dispositions regarding MSR still remain in force, as it can be inferred from paragraph 2 of Article 35(1) of such legal instrument. Decree-Law No. 52/85, of 1 March, reflects many UNCLOS dispositions regarding MSR and grants to Portugal the right to regulate, authorize and carried out MSR projects in the internal waters, in the territorial sea and in the EEZ.⁵¹⁴ This legal framework is independent of the legal statute of the continental shelf,⁵¹⁵ and it does not regulate MSR carried out in the extended continental shelf, although, as defended by Ribeiro, it can be argued that its regime shall be extended to this zone.⁵¹⁶

From the provisions of Decree-Law No. 52/85, of 1 March result a few rules that shall apply when UUVs are used in a pure MSR project that do not require the exclusive reservation of a certain area of the marine environment, as follows:

- In order to get authorization to conduct pure MSR, entities shall submit an application within 6 months in advance to the Ministry of the Sea. The application shall include information on the description of the process, the methods and means to be used, including name, tonnage, type and the main characteristics of the vessels or any floating devices, description of scientific equipment and materials to be used, as well as the indication of any installation to be built and the characteristics of the work to be performed.⁵¹⁷ Consequently, the use of any UUV to collect information in a pure MSR project shall be properly mentioned in the description of the project;
- The project shall also indicate the expected date of the end of the project and the removal of any equipment and UUVs, even those that are sunken or stranded in the marine environment;⁵¹⁸

512 Decree-Law No. 52/85, of 1 March, which lays down provisions on the exercise of activities in the national EEZ, available at <https://dre.pt/application/file/a/326209>.

513 Decree-Law No. 278/87, of 7 July approves the legal regime for the exercise of fishing and maritime cultures in waters under Portuguese sovereignty and jurisdiction, which was amended several times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1730&tabela=leis.

514 Article 1 and 18(1) Decree-Law 52/85, of 1 March (n 512).

515 *Ibid.*, Article 23.

516 See Ribeiro, *A Proteção da Biodiversidade* (n 36), at p. 765.

517 Article 19(1)(b) Decree-Law No. 52/85, of 1 March (n 512).

518 *Ibid.*, Articles 19(1)(d).

- One of the aspects that the Portuguese authorities shall take into consideration when assessing a MSR project, is the appropriate means and methods to be employed for collecting marine data.⁵¹⁹ There is no further regulations that clarify what appropriate means and methods are, which makes it hard to identify a list of methods that can be legally employed. Projects using UUVs shall be aware that they cannot interfere with other legitimate uses of the sea and shall comply with the laws and the regulations in force, in particular those aimed at protecting and preserving the marine environment, its resources and the underwater archaeological heritage;⁵²⁰
- Pure MSR projects implemented by national entities shall be authorized by the Ministry of the Sea;⁵²¹
- Pure MSR projects implemented by foreign entities or by international organizations shall be authorized by the Ministry of Foreign Affairs that shall consult with the Ministry of Defence and with any other ministerial departments that shall be consulted depending on the area where the project is going to be implemented. This includes the Government of the Autonomous Regions when the project is going to be implemented in the maritime areas adjacent to their territory;⁵²²
- Projects implemented by foreign entities or by international organizations have additional limitations that do not relate to the use of methods. Foreign entities and international organizations are not entitled to undertake MSR projects in the internal waters and in the territorial sea.⁵²³ MSR projects carried out in the territorial sea are subject to special regulations to be defined by the Ministry of the Sea.⁵²⁴ These regulations have not been approved yet. In addition, the Ministry of the Sea is entitled to authorize other competent public or private national entities to develop research activities in the same area where foreign entities are researching, provided that such activities are carried out under the umbrella of the State.

519 *Ibid.*, Article 19(2)(b).

520 *Ibid.*

521 *Ibid.*, Article 18 (3).

522 *Ibid.*, Article 18 (4).

523 *Ibid.*, Article 19(2)(a), *in fine, contrario sensu*.

524 *Ibid.*, Article 20(1).

3. Pure MSR projects that require the exclusive reservation of a certain area of the marine environment

The legal regime for pure MSR carried out in waters under Portuguese sovereignty or jurisdiction that requires the exclusive reservation of a certain area of the marine environment is regulated by the aforementioned Decree-Law No. 52/85, of 1 March, and complemented by Decree-Law No. 38/2015, of 12 March, which regulates Law No. 17/2014, of 10 April⁵²⁵ that approves the legal framework for national marine spatial planning and management policy.⁵²⁶ The process to obtain the authorization is more complex, but once the title for private use of the national maritime space (*título de utilização privativa*)⁵²⁷ is issued the holder is entitled to exclusively use a certain area of the marine environment that can be granted up to 10 years maximum⁵²⁸ free of charge.⁵²⁹

3.1 Information required on the methods and means

Besides the authorization that shall be granted by the Ministry of the Sea under Article 18(3), of Decree-Law No. 52/85, of 1 March, pure MSR projects that require the exclusive reservation of a certain area of the marine environment shall also have a title for private use of the national maritime space. Since it is the Ministry of the Sea, through Directorate General of Natural Resources, Safety and Maritime Services - *Direção Geral dos Recursos Naturais, Segurança e Serviços Marítimos*- (DGRM) that grants both authorizations, it is not clear, from the current legal framework, whether or not the title for the private use of the national maritime space substitutes the authorization imposed under Decree-Law No. 52/85, of 1 March. In principle, since the procedures under Decree-Law No. 38/2015, of 12 March are more demanding, there is no justification to keep both documents.

The application shall be requested electronically⁵³⁰ in the DGRM's webpage or by mail,⁵³¹ 6 months before the beginning of the project⁵³² and shall contain de-

525 Decree-Law No. 38/2015, of 12 March, which regulates Law No. 17/2014, of 10 April, available at <https://dre.pt/application/file/a/66734680>; as amended by Decree-Law No. 139/2015, of 30 July, available at <https://dre.pt/application/file/a/69906419>.

526 Law No. 17/2014, of 10 April (n 345).

527 *Ibid.*, Articles 48 and 57(1) Decree-Law No. 38/2015, of 12 March (n 525).

528 *Ibid.*, Article 57(2).

529 *Ibid.*, Article 57(4).

530 *Ibid.*, Article 58.

531 See DGRM's webpage, available at <https://www.dgrm.mm.gov.pt/as-om-tupem>.

532 Article 19(1) Decree-Law No. 52/85, of 1 March (n 512).

tailed information on the MSR project, namely the project document that describes and justifies the project as well as all the information identified in Article 19 of Decree-Law No. 52/85, of 1 March, in Article 58 and in the annex I of Decree-Law No. 38/2015, of 12 March.

The obligation to indicate in the research project the methods and means to be used, including UMVs, as well as the obligation of removal, as early mentioned also apply in this case.⁵³³ Three additional requirements shall be in place when UMVs are used in MSR projects that do require the exclusive reservation of a certain area of the marine environment:

- The law imposes signaling and safety standards to be adopted, when justified.⁵³⁴ Therefore, it may be relevant to consider having some type of signaling that identify UMVs involved;
- Indication of any land-based infrastructures that are necessary for the activity shall also be indicated in the MSR project.⁵³⁵ This should include land-based infrastructures aimed at supporting UMVs operations;
- The law imposes that civil liability insurance shall be in place to cover damages to third parties by action or omission caused by the holders of the authorization, their representatives or any other person at working on the MSR project.⁵³⁶ It is important that this insurance covers the damages caused by scientific equipment, including UMVs.

3.2 Assessment of the application

Before the decision is made, the process is analyzed and several national entities are consulted⁵³⁷ in order to give their opinion regarding the part of the MSR project that may relate to their competences and responsibilities. After the consultation, the DGRM shall take a decision to authorize or to refuse the MSR project.

The reasons that may justify the refusal of the application are set forth in Article 61 of Decree-Law No. 38/2015, of 12 March, and in principle, are not related to the

533 *Ibid.*, Articles 19(1)(b) and 20(2)(f).

534 Article 58(2)(c) and annex I(VI)(c), Decree-Law N. 38/2015, of 12 March (n 525).

535 *Ibid.*, Article 58(2)(c) and annex I(VI)(d).

536 *Ibid.*, Article 67(1).

537 *Ibid.*, Article 60(2) and annex II.

use of any special method of research. Yet, entities are also entitled to refuse authorization when the MSR project is not for peaceful purposes, use scientific and technical methods that are not appropriate, interferes with other legitimate uses of the oceans, or does not comply with law and regulations in force, particularly those aimed at protecting the marine environment, its resources and the underwater cultural heritage.⁵³⁸

This is a significant aspect that may require further considerations with regard to the use of UUVs. Both the UNCLOS⁵³⁹ and domestic legislation⁵⁴⁰ mention the importance of using appropriate methods of research. Neither the UNCLOS nor domestic legislation provides for the assessment of what an appropriate method would be. By default, there is no legal justification to refuse MSR projects based on the argument that a UUV is not an appropriate method of research. UUVs as any other technological devices are a lawful method, as long as they do not interfere with other legitimate uses of the ocean, their use do not hamper the marine environment either result in a breach of the UNCLOS.⁵⁴¹ In order avoid any questions, it is recommended that any MSR proposal provides detailed information, notably regarding the UUVs involved, including reference to its dimension, colour, format, propulsion, endurance, and technology employed for operation, explanation on how UUV will operate and collect information, and the existence of insurance.

4. Pure MSR projects carried out in maritime areas adjacent to the Autonomous Regions of Azores and Madeira

When the MSR project is going to be carried out in the territorial sea, in the EEZ, and on the continental shelf up to 200 nautical miles adjacent to the Autonomous Regions of Azores and Madeira, the competence to issue the authorization belongs to the Regional Government.⁵⁴²

In Azores, the process was approved by Regional Legislative Decree No. 9/2012/A, of 20 March,⁵⁴³ which defines the legal regime for access and use of natu-

⁵³⁸ Article 19(2)(a), Decree-Law No. 52/85, of 1 March (n 512).

⁵³⁹ Article 240(b) UNCLOS.

⁵⁴⁰ Article 19(2)(b), Decree-Law No. 52/85, of 1 March (n 512).

⁵⁴¹ Matz-Lück, 'Article 240' (n 196), at p. 1621.

⁵⁴² Article 51(1) Decree-Law No. 38/2015, of 12 March (n 525). However, when the MSR project does not require the exclusive reservation of a certain area of the marine environment, the Regional Government does not grant the authorization but is consulted to provide a written opinion regarding the project. See, Article 18(4) Decree-Law No. 52/85, of 1 March (n 512).

⁵⁴³ Regional Legislative Decree No. 9/2012/A, of 20 March, which approves the legal regime for access and use of natural resources for scientific purpose in the Autonomous Region of Azores, available at <https://dre.pt/application/file/a/553566>.

ral resources for scientific purpose in the Autonomous Region of Azores, and Regional Regulation No. 20/2012 of 5 November.⁵⁴⁴ The legal regime applies not only to collection of natural resources for scientific purposes, including biological and genetic resources but also to access and fair equitable sharing of these resources for scientific purposes,⁵⁴⁵ whether the research is carried out by universities, business companies or any other entities, such as research centers or institutes.⁵⁴⁶

The authorization can be requested online on the Regional Directorate of the Sea webpage,⁵⁴⁷ under the umbrella of the Regional Secretariat for the Sea, Science and Technology,⁵⁴⁸ while the license depends on the nature and the location of the resource, but shall also be requested online.⁵⁴⁹ The application for authorization of the license shall be presented 45 days before the beginning of the project⁵⁵⁰ and shall contain the elements identified in Article 6 of Regional Regulation No. 20/2012/A, of 5 November.

The project document shall have information on the methodology employed for research, as well as the expected date of beginning and duration of the project.⁵⁵¹ When explaining the methodology of the project, information on the collection of data, including the use of any UMV for such a purpose shall be mentioned.

MSR projects to be carried out in the territorial sea, in the EEZ, and on the continental shelf up to 200 nautical miles adjacent to the Autonomous Regions of Madeira shall be authorized by the Regional Government.⁵⁵² The Regional Government of Madeira has not passed any specific regional legislation that regulates procedures to authorize MSR in waters adjacent to the Region. Within the structure of the Regional Government of Madeira, the Regional Secretariat of Environment and Natural Resources is the governmental agency with responsibility to promote MSR.⁵⁵³ The office of the Secretary of Environment and Natural Resources was contacted and

544 Regional Regulation No. 20/2012/A of 5 November, which regulates the Regional Legislative Decree No. 9/2012/A, of 20 March (*Decreto Regulamentar Regional*) available at <https://dre.pt/application/file/a/191577>.

545 Article 1 Regional Legislative Decree No. 9/2012/A, of 20 March (n 543).

546 *Ibid.*, Article 2(i).

547 Regional Directorate for Sea, *online services*, available at http://servicos-sraa.azores.gov.pt/doit/departamentos.asp?id_dep=10.

548 Article 9(2) Regional Legislative Decree No. 9/2012/A, of 20 March (n 543).

549 Article 5(2) Regional Regulation No. 20/2012/A of 5 November (n 544).

550 *Ibid.*, Article 5(3).

551 *Ibid.*, Article 6(1)(e).

552 Article 51(1) Decree-Law No. 38/2015, of 12 March (n 525).

553 Article 2(h) Regional Legislative Decree No. 8/2015M, of 5 August, Organic Law of the Regional Secretariat of Environment and Natural Resources, available at <https://dre.pt/application/file/a/69951052>.

confirmed that there are no procedures in place and informed that applications to conduct MSR shall be sent in writing directly to the Secretary of Environment and Natural Resources with the relevant information.

5. General requirements for applied MSR

Applied MSR projects that require the exclusive reservation of certain areas of the marine environment⁵⁵⁴ are subject to the legal regime provided for in Decree-Law No. 38/2015, of 12 March, as well as other special legislation depending on the area and sector where the MSR project is going to be carried out, such as fisheries, petroleum, and geological resources. Yet, while pure MSR projects are subject to authorization, applied MSR are subject to concession or license, depending on the duration of the activity.⁵⁵⁵

- **Concession** - applied MSR projects that, for at least 12 months or more, intend to use, without interruption, a maritime area under Portuguese sovereignty or jurisdiction are subject to concession.⁵⁵⁶ Concession is granted by fix-term contract issued electronically⁵⁵⁷ but depends on the payment of fees,⁵⁵⁸ unless projects are aimed at exploring or exploiting geological and energetic resources, which are exempt from payment.⁵⁵⁹ The exact duration of the contract depends on the nature and the dimension of the project as well as the expected time that is necessary, in normal circumstances, for amortization and remuneration of the capital invested, up to a maximum of 50 years.⁵⁶⁰ The concession contract is subject to certain public procurement rules⁵⁶¹ and shall include full information required by law, including those regarding the means and assets that are going to be employed in the project.⁵⁶² UMs can be included in this category and, consequently, shall be indicated in the project document;

554 Articles 47 and 57(1) Decree-Law No. 38/2015, of 12 March (n 525).

555 *Ibid.*, Articles 52 and 54.

556 *Ibid.*, Article 52(1)(2).

557 *Ibid.*, Article 53(1).

558 *Ibid.*, Article 52(3)(4).

559 *Ibid.*, Article 52(4); Article 2(2), Regulation (*Portaria*) 128/2018, of 9 May, regulates the amount of the fees to be paid available at <https://dre.pt/application/file/a/115251382>.

560 Article 52(3) and 53(3) Decree-Law No. 38/2015, of 12 March (n 525).

561 *Ibid.*, Article 53(5).

562 *Ibid.*, Article 53(4)(e).

- **License** - applied MSR projects that intend to use a maritime area under Portuguese sovereignty or jurisdiction for a period of time less than 12 months or during seasonal or certain intermittent periods of the year are subject to license.⁵⁶³ License can be granted for up to 25 years and is always subject to payment of fees.⁵⁶⁴ The license is issued online, and shall contain the information required by Article 56 of Decree-Law No. 38/2015, of 12 March, which does not impose information on the methods to be submitted.

Besides the legal requirements imposed by Decree-Law No. 38/2015, of 12 March, applied MSR projects are also subject to Article 20(3) of Decree-Law 52/85, of 1 March, which relates to the disclosure of results. In applied MSR projects, the holder of the concession or the license cannot release, without the consent of the Portuguese Government, any information or data collected in MSR projects regarding exploration and exploitation of natural resources.

It shall be pointed out that the title for the private use of national maritime space does not automatically grant the holder the right to use or explore the resources, which are subject to special legislation approved by specific sectors, such as fisheries, petroleum, geological and genetic resources.

5.1 Applied MSR in the fisheries sector

For applied MSR projects in the fisheries sector, an exceptional license can be issued provided that the research is controlled by the fisheries administration and supervised by a scientific institution with recognized scientific merit. The license can be used, for instance, for experiments and juvenile restocking and it can be repealed at any time.⁵⁶⁵

By default, the license is issued by DGRM or by the Regional when the license is granted to a fishing vessel and its gears registered in the Autonomous Regions to fish in waters under national jurisdiction adjacent to the Autonomous Regions,⁵⁶⁶ or when the license is granted to fish without a vessel and its gears, in waters adjacent to the Autonomous Regions.⁵⁶⁷

⁵⁶³ *Ibid.*, Article 54(1)(2).

⁵⁶⁴ *Ibid.*, Article 55(2)(3).

⁵⁶⁵ Article 74(3), Regulation (*Decreto Regulamentar*) No. 16/2015, of 16 September (n 404).

⁵⁶⁶ *Ibid.*, Article 75(1)(a).

⁵⁶⁷ *Ibid.*, Article 75(1)(b).

The license to carry out applied MSR in the fisheries sector can be requested at any time,⁵⁶⁸ and once the application is submitted the authorities have 90 days to decide.⁵⁶⁹ The Regulations in force as well as the Ministerial Dispatches⁵⁷⁰ complementing the Regulations do not provide any further details regarding the attribution of license for applied MSR in the fisheries sector, notably in terms of the methodology or equipment to be used in the research. Nonetheless, for the entities to be able to take a decision, there are a certain of minimum information that shall be submitted, such as the nature, duration, and objectives of the project, as well as methods for collecting information. Therefore, UUVs used in applied MSR projects in the fisheries sector shall be mentioned in the project document.

5.2 Applied MSR in the petroleum sector

Applied MSR projects in the petroleum sector carried out in the Portuguese territorial sea or in the continental shelf shall be granted by concession.

In order to facilitate the acquisition and assessment of information that is able to technically support the preparation of any applied MSR project, Portuguese law permits that a special license known as prior assessment license may be issued.⁵⁷¹ Upon payment of a certain fee,⁵⁷² this license may be given to any entity, which has proven to have technical, economic and financial competence to carry out the project. The law does not require or impose, as it requires for pure MSR projects, that information regarding the equipment used in the research shall be provided. Nevertheless, it does require that technical means available as well as other elements that are relevant for the assessment of the application shall be submitted.⁵⁷³ The use of UUVs in the project is both a technical means of research as well as a relevant information to be submitted. Therefore, it can be argued that detailed information on its use shall be part of the application.

568 *Ibid.*, Article 75(4).

569 *Ibid.*, Article 76(2).

570 See Ministerial Dispatch No. 14694/2003, of 29 July, available at <https://dre.pt/application/file/a/1717896>, accessed 29 July 2018; as amended by the Ministerial Dispatch 16945/2009, of 23 July, available at <https://dre.pt/application/file/a/2429068>.

571 Article 23 Decree-Law No. 109/94, of 26 April, which approves the legal regime for prospection, exploration, and production of petroleum activities, available at <https://dre.pt/application/file/a/265448>; accessed 18 July 2018; as amended by Law No. 82/2017 of 18 August, available at <https://dre.pt/application/file/a/108016629>.

572 *Ibid.*, Article 54(1)(a).

573 *Ibid.*, Article 23(1).

The request is submitted to the National Authority for the Energetic Sector - *Entidade Nacional para o Setor Energético, E.P.E.* (ENSE), which issues the license.⁵⁷⁴ The license is granted for contiguous batches⁵⁷⁵ and automatically expires after 6 months.⁵⁷⁶ When the license is in place no other concession contracts can be granted to any other entity in the same area.⁵⁷⁷

Applied MSR projects that further require prospection and research are subject to concession.⁵⁷⁸ Prospection and research include, besides desk review of documents, any fieldwork in the targeted area with the purpose of discovering petroleum reserves.⁵⁷⁹ The concession is granted by the Minister responsible for the energy sector,⁵⁸⁰ through public tender or a single source.⁵⁸¹ Entities that are able to prove that they hold technical, economic and financial reputation will be, in principle, accepted in the tender.⁵⁸² The law does not require that information on the methods to be used in the research and equipment employed shall be submitted. Therefore, it seems that this is not a relevant aspect to be taken into account when the public authorities analyze the project. However, when addressing the technical capacity of the entity,⁵⁸³ it may be relevant to make reference the use of UMs that may support the research, as long as their use is able to strengthen the capacity of the entity.

Concession contracts last, in principle, 8 years⁵⁸⁴ with the possibility of renewal, for one more year upon requirement of the applicant.⁵⁸⁵

Since 2017, applied MSR projects in the petroleum sector are subject to an environmental impact assessment (EIA).⁵⁸⁶ For this reason, once the application is received

574 *Ibid.*, Article 9; see also Decree-Law No. 339-D/2001, of 28 January, as republished by Decree-Law No. 69/2018, of 27 August that restructure the National Entity for Fuel Market, available at <https://dre.pt/application/file/a/116165868>.

575 Article 26, Decree-Law No. 109/94, of 26 April (n 571).

576 *Ibid.*, Articles 25 and 57(a).

577 *Ibid.*, Article 24(2).

578 *Ibid.*, Article 5(1).

579 *Ibid.*, Article 30.

580 *Ibid.*, Article 6(1).

581 *Ibid.*, Article 5(1).

582 *Ibid.*, Article 11(1).

583 *Ibid.*, Article 15(2)(a).

584 *Ibid.*, Article 22(1).

585 *Ibid.*, Article 22(2).

586 See Decree-Law No. 151-B/2013, of 31 October, which establishes EIA legal regime, available at <https://dre.pt/application/file/a/513900>; accessed 27 July, as amended by Law No. 37/2017, of 2 June, available at <https://dre.pt/application/file/a/107111258>; and amended and republished by Decree-Law No. 152-B/2017, of 11 December, available at <https://dre.pt/application/file/a/114336848>.

and before granting the license, ENSE shall consult with the EIA authority, which can be either the Portuguese Environmental Agency / *Agência Portuguesa do Ambiente* or the Regional Commission for Coordination and Development / *Comissão de Coordenação e Desenvolvimento Regional*. The EIA authority shall provide its opinion on the possibility for the project to cause significant impact on the environment.⁵⁸⁷

To carry out any exploration or prospection activities or to place any infrastructure or equipment in the Portuguese continental shelf without a proper license is an administrative offence, which may result in the payment of an administrative fine between 2200 to 3700 euros when the offence is committed by a natural person or between 10000 to 44000 euros in case the offense is committed by legal persons.⁵⁸⁸

5.3 Applied MSR in the geological sector

Applied MSR projects in maritime areas under Portuguese sovereignty and jurisdiction⁵⁸⁹ with the purpose of exploiting geological resources, such as mineral deposits, are subject to administrative contract.⁵⁹⁰ Exploitation of geological resources is carried out in concessionary areas⁵⁹¹ and comprises all activities and operations aimed at discovering geological resources and their features until their economic value is confirmed.⁵⁹²

As occurs in the petroleum sector, the law permits that prior assessment rights may be granted to promote a better understanding of the existing resources, which comprises conducting studies, and may include, as well, an analysis of the information available and a collection of samples.⁵⁹³ The application is submitted to the General Directorate for Energy and Geology - *Direção Geral de Energia e Geologia* (DGEG) along with the necessary elements to prove the required technical, economic and financial competence of the applicant, the indication of the objectives to be achieved, the area to be researched, the technical and financial means available, the expected budget to be used, as well as any other elements that are considered

587 *Ibid.*, Article 3(3).

588 Article 4(1)(j)(2) Decree-Law No. 45/2002, of 2 March (n 466).

589 Article 1(2)(a), Law No. 54/2015, of 22 June, which approves the legal framework for exploration and exploitation of geological resources, including those located in maritime areas, available at <https://dre.pt/aplicacao/file/a/67552586>.

590 *Ibid.*, Articles 13(2) and 20.

591 *Ibid.*, Article 2(e).

592 *Ibid.*, Article 2(p).

593 *Ibid.*, Article 16(3).

relevant for assessment of the application.⁵⁹⁴ This is another example of applied MSR where the law does not require that information regarding the equipment used in the research shall be provided. As noted, it does impose, however, that information regarding the technical means available as well as any other element that is relevant for the assessment of the application shall be submitted. The use of UMs in the project is both a technical means of research as well as relevant information to be submitted. Therefore, it can be argued that detailed information on the use of UMs shall be part of the application.

Once the application is submitted the requested area is published on the DGEG website and no longer becomes available for other requests.⁵⁹⁵ Prior assessment rights are granted by administrative contract and are exclusive.⁵⁹⁶ The contract can last maximum 1 year without any possibility of renewal.⁵⁹⁷

Complementary legislation regulating procedures to request concession of prior assessment rights has not been approved yet.⁵⁹⁸

Applied MSR projects that require exploration and prospection to further develop activities aimed at discovering geological resources and their features until their economic value is confirmed⁵⁹⁹ are subject to concession contracts.⁶⁰⁰ In any case, it is important to note that only maritime areas available and duly identified in the maritime spatial planning documents (*plano de situação*) can be subject to concession for these purposes.⁶⁰¹

Concession contracts can only be entered into with legal persons with recognized technical and financial capacity to carry out the project.⁶⁰² The procedures that shall be observed to request the attribution of rights to explore and prospect through a concession contract have not been approved yet.⁶⁰³

594 *Ibid.*, Article 16(2).

595 *Ibid.*, Article 16(4).

596 *Ibid.*, Article 13(2).

597 *Ibid.*, Article 17(b).

598 *Ibid.*, Articles 16(6).

599 *Ibid.*, Article 13(1)(b).

600 *Ibid.*, Article 20.

601 *Ibid.*, Article 18(3).

602 *Ibid.*, Article 19(4).

603 *Ibid.*, Article 19(1).

Concession contracts for exploration and prospection of mineral resources in maritime waters under Portuguese sovereignty and jurisdiction are exclusive.⁶⁰⁴ However, the law permits that the rights for prospection and exploration are given to areas that are being used when there is no incompatibility with ongoing concessions or concessions in negotiation.⁶⁰⁵

6. The legal regime applicable to the use of UMMs in pure MSR

The Portuguese domestic legal framework does not recognize directly the existence of UMMs neither provides a specific legal regime for their construction or acquisition. The situation was similar to aerial drones, which enjoy a recently approved legal regime.⁶⁰⁶ This was motivated by the fact that the use of unmanned aerial drones has become subject of recent trends, particularly for commercial and leisure activities, by some concerns raised due to several incidents that were reported during the past years, and by the opinion released in 2018 by European Aviation Safety Agency on safe drone operations in Europe.⁶⁰⁷

The importance of defining rules for the use of UMMs for MSR and for other activities shall not be neglected by the national legislator, and represent an opportunity not only to promote their development by the industry but also to ensure that the use of UMMs in waters under Portuguese sovereignty and jurisdiction is properly framed especially when it comes to damages.

In the current legal vacuum and uncertainty, UMMs can be constructed without observation of any specific rules or guidelines, notably in terms of safety but also be freely commercialized and operated. It is up to the industry that is involved in their production to define rules for construction and ensure that commercialization and operations are carried out within the law, even when their particular situation is not properly regulated.

⁶⁰⁴ *Ibid.*, Article 13(2).

⁶⁰⁵ *Ibid.*, Article 19(5).

⁶⁰⁶ See, the National Civil Aviation Authority Regulation No. 1093/2016, of 14 December 2016 that approves the conditions for operations of unmanned aerial drones in the national airspace available at <https://dre.pt/application/file/a/105366569>; Decree-Law No. 58/2018, of 23 July that creates a registration system and a mandatory civil insurance for aerial drones, available at <https://dre.pt/application/file/a/115741324>.

⁶⁰⁷ European Aviation Safety Agency, *Introduction of a regulatory framework for the operation of unmanned aircraft systems in the 'open' and 'specific categories'*, (Opinion 01/2018), available at <https://www.easa.europa.eu/sites/default/files/dfu/Opinion%20No%2001-2018.pdf>.

6.1 UUVs' ownership and registration

UUVs are not subject to any mandatory registration under Portuguese law. Therefore, the deployment and use of UUVs in waters under Portuguese sovereignty or jurisdiction for MSR or for any other purpose does not depend on the existence of any registration. As a result, it is virtually impossible to identify the owner of a UUV that is freely operating at sea, that is lost or that produces any damage to the marine environment.

This legal regime, contrasts with the solution adopted for aerial drones, which up to a certain size, are subject to registration by the National Authority of Civil Aviation – *Autoridade Nacional de Aviação Civil* (ANAC).⁶⁰⁸ All aerial drones used for commercial and private uses are subject to the obligation of registration. Even aerial drones used for less than a month by foreigners are subject to this obligation.⁶⁰⁹ Only State-owned aerial drones operated under the direction of ANAC, by environmental and territorial planning inspection services and by the services that are responsible for controlling the financial support granted to the agriculture sector, are exempt from this obligation.⁶¹⁰ The registration is subject to the payment of fees⁶¹¹ that shall be made by the operator⁶¹² but the vendor is also in charge of communicating the sale.⁶¹³

This is a public registration that comprises the name of the aerial drone, the contact of the operator and any relevant information regarding the existence of any mechanism that is able to affect the privacy or to capture images or sounds.⁶¹⁴ Moreover, the registration also creates a code of identification with 10 digits that shall be placed in the aerial drone and maintain in good condition in order to be clearly visible, unless the aerial drone can be identified electronically.⁶¹⁵ If the owner of the aerial drone decides to lend or rent it to third parties it shall provide ANAC with such information.⁶¹⁶

This report argues that a similar system should be established for UUVs used for commercial and recreational purposes as well as for applied MSR. From a national perspective, the creation of a national registration of UUVs is mainly justified by the

608 Article 3(1)(2), Decree-Law No. 58/2018, of 23 July (n 606).

609 *Ibid.*, Article 3(5).

610 *Ibid.*, Article 1(2).

611 *Ibid.*, Article 14.

612 *Ibid.*, Article 3(3).

613 *Ibid.*, Article 8.

614 *Ibid.*, Article 4(6).

615 *Ibid.*, Article 7(1).

616 *Ibid.*, Article 5(1).

importance of identifying the owner of the device and is justified based on several arguments, such as:

- **Security concerns** - once a UMV is deployed in the territorial sea, States have virtually no chance of controlling its activities, and if some UMVs can be used for lawful activities, others may be employed for illegal ones, and to collect marine information on living and non-living resources in areas under national sovereignty or jurisdiction that shall be under the control of the coastal State;
- **Safety concerns** - currently, the number of UMVs being deployed in the world's oceans is still scarce. In the Portuguese territorial sea, the UMVs used are mainly launched by research institutions, as it is the case of LSTS, and the Navy. In the near future, private small UMVs will become more affordable for private individual to use in different kinds of commercial and leisure activities. This is exactly what happened with aerial drones. Safety rules for users, namely regarding construction and operational manuals have to be in place and the owners shall be responsible for their application;
- **Liability purposes** - UMVs deployed in the marine environment, regardless of their purpose, may cause harm to the marine environment, may interfere with other lawful activities carried out in the ocean, may damage submarine cables or pipelines, and may be involved in marine casualties. For liability purposes, the identification of the owner is essential;
- **Salvage purposes** - for the purpose of salvage and returning objects found at sea, registration and identification of the owners is necessary. If no identification is available, sunk or lost UMVs will hardly be delivered to the owner, since in this case, the UMV would belong to those which possess it;
- **Economic reasons** - the creation of a national registration system for UMVs can be subject to the payment of fees that can be allocated for instance, for financing public activities aimed at protecting the marine environment.

Registration of UMVs may be done by the operator, who shall be understood in a broad way, as it is the case with the definition given for the operators of aerial drones.⁶¹⁷ Hence, the operator may include any natural or legal person involved or that aims to be involved in the operation of a UMV. In case there are entities which

⁶¹⁷ *Ibid.*, Article 2(f).

are not legal persons, as may happen with laboratories, the registration shall be done by the person in charge of the laboratory.

Exceptions to registration may be justified in some situations, for instance:

- 1) For UUVs that are being developed by research institutions and are still in the testing or experimental phase;
- 2) For UUVs used for pure MSR conducted by research institutions that will operate in the territorial sea;
- 3) Military UUVs, and UUVs owned or operated by the State for non-commercial purposes.

6.2 UUVs as an appropriate method of research

For a UUV to be accepted in a MSR project it needs to be considered as an appropriate method of research, as imposed by the UNCLOS and by national legislation. As noted, neither the UNCLOS nor the domestic legislation provides any idea on what an appropriate method of research would be. Despite this legal vacuum it seems that there is no legal justification to adopt a narrow interpretation of the concept of appropriate method of research and refuse MSR projects based on the argument that a UUV is inappropriate. UUVs as any other technological device, shall be considered as a lawful method, as long as they do not interfere with other legitimate uses of the ocean, do not hamper the marine environment and provided that no other obligations established by the UNCLOS are breached.⁶¹⁸

In order to avoid any questions that may request clarifications on the use of UUVs, it is recommended that a new legal framework is approved that beyond establish the proper legal framework for UUVs to operate under the Portuguese legal system, also clarifies what is the relevant information that shall be made available in the project document regarding the use of UUVs. In the future, proposals may include, for instance the following information:

- The type of the UUV involved, including a reference to its dimension, colour, format, propulsion, endurance, and technology employed for operation;
- The ownership of the UUV;

⁶¹⁸ Matz-Lück, 'Article 240' (n 196), at p. 1621.

- An explanation on how the UMV will operate and collect the necessary information, so it can be clear, for instance, that the UMV will not be used for applied MSR projects and for collecting information on natural resources;
- Signaling and safety measures to be observed for the safety of navigation and protection of the marine environment.

6.3 Obligations of the entity in charge of the MSR project

MSR research projects whether pure or applied that employ U MVs for collecting marine data are subject to several obligations. These obligations are transversal to the entire project's life, in the sense that they start when the project is being designed, they apply during the execution of the project and only terminate after the project is completed.

6.3.1 The obligation of information

When pure MSR projects are being designed the applicant shall provide detailed information on the nature and the objectives of the project, as well as information regarding the methods of research to be used and the scientific equipment involved.⁶¹⁹ This obligation is not mandatory in applied MSR in the petroleum sector⁶²⁰ and in the geological sector,⁶²¹ but its inclusion is likely to be relevant. As noted early above, it is recommended that applicants provide in the research project a full description of the U MV to be used and indicate the data of its removal from the marine environment. When the MSR project requires a title for the private use of the marine environment, information on the signaling that identifies U MVs, and information regarding the land-based infrastructures that may eventually exists to support the U MVs shall also be provided.⁶²²

6.3.2 The obligation to maintain the good environmental status of the marine environment

While the project is being executed the use of U MVs shall be done properly and through the adoption of all necessary measures to maintain the good environmental

619 Article 19(1)(d), Decree-Law No. 52/85, of 1 March (n 512).

620 Article 27, Decree-Law No. 109/94, of 26 April (n 571).

621 Article 16(2), Law No. 54/2015, of 22 July (n 589).

622 Article 58(2)(c) and annex I(VI)(c)(d), Decree-Law No. 38/2015, of 12 March (n 525).

status of the marine environment.⁶²³ The law does not give any suggestion regarding the concretization of this duty. It can be argued that this is an obligation of conduct in the sense that imposes that, while UMVs are being used for MSR purposes, their activity shall be done in a diligent manner in order to maintain the marine environment in the good state it was before the use of UMVs in that area. Additionally, when the MSR is completed, there is an obligation to adopt the necessary measures to reconstruct any physical conditions that may have suffered changes as a result of the project.⁶²⁴

6.3.3 The obligation of signaling

While the project is being executed the use of UMVs shall observe signaling measures as well as safety norms to ensure that UMVs navigate safely.⁶²⁵ Despite the law does not explicitly referring to UMVs as such, this is a general obligation that applies to any equipment used in MSR and there is no legal ground to exclude its application to UMVs. For instance, gliders and any other floating devices used in MSR in waters under Portuguese sovereignty and jurisdiction are subject to these obligations but not subject to any specific legal regime. Therefore, what is worth discussing is whether or not UMVs, due to their specific features, require additional regulations to be passed, notably in terms of safety of navigation. While there are no internationally agreed rules for the signaling of UMVs, the Portuguese legal system may adopt interim measures to facilitate the identification of UMVs navigating in waters under Portuguese sovereignty and jurisdiction especially in the territorial sea.

6.3.4 The obligation of removal

When the MSR project is completed, there is an obligation to remove all equipment.⁶²⁶ This obligation is mainly applicable to fixed structures and to installations constructed, but applies to UMVs. As a result, even when UMVs are stranded or sunk there is a clear legal obligation to remove them from the marine environment.

6.4 Information collected by UMVs and personal data protection

EU Regulation 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal

623 *Ibid.*, Article 46(3).

624 Article 17(4), Law No. 17/2014, of 10 April (n 345).

625 Article 58(2)(c) and Annex I, (VI)(c), Decree-Law No.38/2015, of 12 March (n 525).

626 Articles 19(1)(d) and 20(1)(f), Decree-Law No. 52/85, of 1 March (n 512).

data and on the free movement of such data⁶²⁷ entered into force on 25 May 2018. This legal instrument has introduced a new legal regime for processing of personal data that applies to information processed for the purpose of MSR, notably those personal data collected by UUVs.

As highlighted in paragraph 159 of the preamble, the personal data processed for scientific research purposes is clearly subject to the legal regime of this Regulation and it shall be interpreted in a broad manner, in order to include *‘for example technological development and demonstration, fundamental research, applied research and privately funded research.’*

EU Regulation 2016/679 adopts a very wide concept of personal data that covers *‘any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person;’*⁶²⁸ Data regarding legal persons are not subject to this legal regime.

Processing of personal data comprises *‘any operation or set of operations which is performed on personal data or on sets of personal data, whether or not by automated means, such as collection, recording, organization, structuring, storage, adaptation or alteration, retrieval, consultation, use, disclosure by transmission, dissemination or otherwise making available, alignment or combination, restriction, erasure or destruction;’*⁶²⁹ Therefore, generally, there is no doubt that any personal data collected by UUVs, such as, an image that is captured by UUVs of persons swimming at the beach falls in the concept of personal data.

UUVs operate in the ocean, both underwater and on the surface. Personal data that is processed is, in principle, of those people that are also in the ocean, on shore, at the beach or on board of a vessel.

EU Regulation 2016/679 does not specifically mention its application to maritime space. Therefore, it is important to discuss its application to personal data collected in the ocean. An analysis of Article 3 of EU Regulation 2016/679 seems to

627 The Regulation EU 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, available at <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679&from=PT>.

628 *Ibid.*, Article 4(1).

629 *Ibid.*, Article 4(2).

induce the idea that personal data collected in the ocean is subject to EU Regulation 2016/679, in the following situations:

- When the processing of such data is carried out by an establishment of a controller or a processor in the EU, even when the processing takes places outside the EU.⁶³⁰ Consequently, should the entity responsible for MSR research project be based in the EU, EU Regulation 2016/679 shall apply, including for such data that is collected outside the EU, as it is case of information collected on the high seas;
- When the processing of such data subjects who are in the EU by a controller or processor not established in the EU,⁶³¹ but only when the processing activities are related to the offering of goods⁶³² or the monitoring of their behaviors.⁶³³ This will hardly apply to UMLVs;
- When the processing of personal data is carried out by a controller not established in the EU, but rather in a place where Member State law applies by virtue of public international law.⁶³⁴ This may be the case, for instance, of data collected on board of a Portuguese flag vessel, regardless of the maritime area where it occurs.

In principle, personal data capture by UMLVs is subject to EU Regulation 2016/679. However, in practice, persons are not likely to be the purpose of a MSR project. In any case, should personal data be captured, the exception provided for in Article 11 of EU Regulation 2016/679 is likely to apply. This provision regulates processing which does not require identification. It determines that in cases that do not or do no longer require identification of data, the controller shall not be obliged to maintain the information in order to identify a data subject.

On the contrary, MSR research projects involving, for instance, the collection of MSR information that may require collection of personal data in some way, the consent of the subject is mandatory. Processing of personal data by UMLVs is only lawful when the data subject has given consent to the processing.⁶³⁵ The consent shall be

630 *Ibid.*, Article 3(1).

631 *Ibid.*, Article 3(2).

632 *Ibid.*, Article 3(2)(a).

633 *Ibid.*, Article 3(2)(b).

634 *Ibid.*, Article 3(3).

635 *Ibid.*, Article 6(1)(a).

express for a specified, explicit and legitimate purpose and may be withdrawn at any time.⁶³⁶ The consent for a certain purpose shall be used for that purposes only and cannot be invoked for data to be used with a different purpose. Yet, an exception is introduced regarding scientific research. Processing of data for scientific purposes is not considered incompatible with the initial purposes and may be considered lawful when the subject of data has not given the consent for the research.⁶³⁷

Processing of personal data collected by UUVs shall be adequate, relevant and limited to what is necessary for the purpose for which they are processed, in accordance with the data minimization principle.⁶³⁸ In addition, information collected is subject to the principle of storage limitation in the sense that data shall be kept for no longer than is necessary for the purposes for which it is processed.⁶³⁹

6.5 Strict liability regime for damages caused by UUVs used in MSR projects

UUVs used in the marine environment for MSR projects may be involved in causalities or situations that may cause damages to the marine environment, to persons, to vessel or other UUVs. In these cases, it is necessary to determine which entity is liable before third parties. Is the entity/person in charge of the project or is the UUV operator?

Under the Portuguese legal regime, those who use other persons to perform any task are liable for all damages caused during the execution of such tasks, under the strict liability regime of Article 500 of the CC. Consequently, should the requirement of Article 500 of the CC be in place, is the entity that is responsible for the MSR project and not the UUV operator that shall be liable before third parties.

Three requirements shall be observed for the entity in charge of the project to be liable for damages caused by the operator of the UUV, as follows:

- A commission must exist between the entity in charge of the project and the UUV's operator. The commission is any service of any nature that one person- the UUV's operator- shall carry out under the direction of another person- the entity in charge of the project. In principle, for this requirement to be observed is enough that the person in charge of the project gives a

⁶³⁶ *Ibid.*, Article 7.

⁶³⁷ *Ibid.*, Articles 5(1)(b) and 89(1).

⁶³⁸ *Ibid.*, Articles 5(1)(c) and 89(1).

⁶³⁹ *Ibid.*, Article 5(1)(e).

general orientation to the UMV's operator regarding the information to be collected, the area and the period of time of the operations;

- The service that is undertaken, notable the MSR data collection by the UMV's operator, shall be done in the interest of the entity who exercises direction and is responsible for the project. Therefore, only damages caused during the performance of an activity undertaken that relates to the interest of the entity in charge of the project are covered by this regime. In order to assess this requirement, it is relevant that the project describes its interests and its purposes properly. If detailed information exists, deviations that are relevant for liability purposes are easy to identify;
- The fact that causes the damage, either to third parties or to the marine environment, shall be produced by the UMV's operator in the exercise of his or her functions. A close link needs to exist between the damage and the functions of the UMV's operator and the damage produced. Damages caused by the UMV allocated to the project but used for any other purposes rather than the project are not covered under this regime. For this reason, the existence of a detailed job description of the UMV operator is relevant;
- For the entity in charge of the project to be liable, the UMV's operator himself or herself needs to be liable too, notably under the regime of fault liability, provided for in Article 483 of the CC.

As it has already been explored regarding the liability of unmanned vessels, there are several requirements that shall be in place for Article 483 of the CC to apply. A quick analysis of the requirements imposed by Article 438 of the CC raises several questions worth discussing regarding unlawful conduct that shall exist in the first place.

Operators of U MVs are only liable when they practice an action or an omission that is translated into unlawful conduct. The omission is only relevant when a duty to act is imposed either by law, by contract or by a general duty of care (*deveres de segurança no tráfego*). Under this duty, those who create a situation of risk shall employ due diligence to avoid the risk of being transformed into damages. While there is no legislation that regulates U MVs and their operations, notably imposing proper signaling, it might be argued that the circulation of U MVs, especially in areas of intense maritime traffic, is considered a dangerous activity, which imposes a general duty of care on operators.

Another aspect that is worth pointing out relates to the proof that shall be demonstrated. In the state of the current legal system it is not likely that any presumption of guilt applies, contrary to damage caused by land vehicles. The CC determines that those who use a land vehicle, even if such vehicle is not in motion, have its effective direction and use it on his or her own interest are liable for the damages caused.⁶⁴⁰ In the same vein, the operators of aerial drones are also subject to a strict liability regime for any damages caused to third parties. However, the law also provides a limit to the amount of the compensation to be paid in case of damages. The maximum amount that the operator of an aerial drone shall pay is the minimum amount of the civil liability insurance.⁶⁴¹ When damages are caused by the injured person this regime of strict liability does not apply.⁶⁴² There is no similar disposition regarding the use of UMMVs. Yet, considering the similarities that exist between aerial drones and UMMVs, it may be justified to create a similar regime in terms of liability.

Section 2

OTHER ASPECTS

1. Maritime insurance to cover UMMVs

The legal regime that currently applies to maritime insurance is set forth from Article 595 to 615 of the Commercial Code. Although title II of the Commercial Code applies, in general, to perils at sea, which is a very broad concept, the fact is that those provisions were drafted having a vessel in mind. As noted earlier, some perils that are mostly connected with unmanned vessels, which are risks that are intertwined with its unmanned nature and technology are not covered by law. The same gap exists regarding UMMVs.

In general, there is no legal imposition for UMMVs, as such, to be subject to insurance. At the current stage, a UMMV is free to operate in waters under Portuguese sovereignty or jurisdiction without being covered by an insurance. However, when UMMVs are employed in activities that are subject to compulsory insurance, it is arguable that the insurance shall also cover damages caused by the UMMVs involved in such activity.

⁶⁴⁰ See Article 503 CC (n 480).

⁶⁴¹ Article 9(2) Decree-Law No. 58/2018, of 23 July (n 606).

⁶⁴² *Ibid.*, Article 9(1).

The approval of a legal framework that establishes compulsory insurance schemes for UMVs that operate in waters under Portuguese sovereignty or jurisdiction and for those registered in Portugal, if such registration is created, shall be discussed at technical level. Discussions shall debate, among others, the list of perils that shall be covered by law, the minimum and maximum amounts of the premiums to be paid, the circumstances where the liability of the insurance company can be waived, etc.

The recently approved legal regime of aerial drones imposes a mandatory insurance contract for aerial drones with a maximum operational mass exceeding 900 grams.⁶⁴³ Specific conditions regarding coverage and minimum capital as well as other important details of the insurance contract are still to be defined by the Government.⁶⁴⁴ It might be useful to consider the discussions held in this forum and once the regulations are approved, to take into account some ideas that may be used to define a similar regime for UMVs.

2. The liability regime for damages caused by UMVs used in other activities rather than MSR

UMVs are devices that may be used in other activities rather than MSR. This includes not only commercial activities at sea but also recreational and pleasure activities. Without going into the detail of each activity that may be performed by UMVs, since this is directly related to the UMVs technical capacity, it is important to assess the general regime that applies in case of damages caused by UMVs used in other activities rather than MSR.

A collision involving UMVs may be classified under Decree-Law No. 384/99, of 23 September⁶⁴⁵ as a sea event. A sea event is any extraordinary occurrence happening at sea or in waters under national jurisdiction, which has caused or is likely to cause damages to ships, floating devices, persons or things being transported. As noted early in this report, rules for liability in case of collision are set forth in the Commercial Code.⁶⁴⁶ This report argues that these rules were defined to regulate collision between ships and shall not apply to UMVs, unless the Commercial Code is amended. It is a fact that the decision of the Portuguese Supreme Court of Appeal

643 *Ibid.*, Article 10(1).

644 *Ibid.*, Article 10(3).

645 Article 13(1), Decree-Law No. 384/99, of 23 September (n 477).

646 Commercial Code (n 478).

has confirmed that the Commercial Code rules regarding collision shall apply not only to vessels but also to floating cranes.⁶⁴⁷ However, a floating crane is a different reality when compared to UMMs. This is mainly because UMMs are, in principle, much smaller than vessels and even floating cranes. When navigating close to a vessel, UMMs are not likely to cause a significant damage. The contrary is more likely to occur.

As a result, collisions involving UMMs, must be subject to the general rules of fault-based liability of the CC, notably Article 493 regarding damages caused by things. Some challenges concerning the assessment of the unlawful conduct that is able to trigger this regime of liability may be put forward. For Article 493 of the CC to apply to a collision that involves UMMs, the following requirement shall be fulfilled:

- The UMM, by its nature, structure or quality, needs to be apt to cause damages to third parties;
- The custody of the UMM needs to be given to the operator, in any title, such as property, leasing, deposit, lending;
- The person that has the custody needs to be assigned to a duty of vigilance of the UMM and comply with a general duty of care (*deveres de segurança no tráfego*). This is an aspect that requires further discussions, because ultimately, this duty of care is a very general concept that will depend on the autonomy of the UMM itself and also on the reliability of the technology involved in its operations.

If the aforementioned requirements are observed, it is the operator of the UMM that has to prove that the collision was not due to its fault, or alternatively that the damages would have been produced in any case, even if no fault had existed.⁶⁴⁸

647 Supreme Court of Appeal, Process 066727 (29/11/1977), available at <http://www.dgsi.pt/jstj.nsf/954f0ce6ad9dd8b980256b5f003fa814/12b2bc1edba993e2802568fc0039885d?OpenDocument>.

648 Supreme Court of Appeal, Process 368/04.OTCSNT.L1.S1 (30/09/2014), available at <http://www.dgsi.pt/jstj.nsf/954f0ce6ad9dd8b980256b5f003fa814/647dcf35227d896380257d63004690f9?OpenDocument>.

Chapter 4

SETTLEMENT OF DISPUTES OVER UNMANNED VESSELS AND UUVs IN THE NATIONAL COURTS

1. The dispute settlement procedures under the Portuguese legal system

The dispute settlement procedures under the Portuguese legal system is designed in the CRP, and developed by ordinary laws and regulations. Courts are public entities with jurisdictional functions that exercise sovereignty with the competence to administer justice in the name of the people.⁶⁴⁹ Courts are independent and are only subject to the law,⁶⁵⁰ their decisions are binding on all public and private entities and prevail over the decisions of any other authority.⁶⁵¹

The Portuguese legal order comprises different categories of courts. In addition to the Constitutional Court, which is a supreme court with responsibility in constitutional matters⁶⁵² the following categories of courts exist in the Portuguese legal order:

649 Article 202(1) CRP.

650 Article 203 CRP.

651 Article 205(2) CRP.

652 Law No. 28/82, of 15 November approves the Constitutional Court Organic Law, was amended 11 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=423&tabela=leis.

- The Supreme Court of Justice and the courts of law of first and second instance;
- The Supreme Administrative Court and the remaining administrative and tax courts;
- The Court of Auditors;
- Maritime courts, arbitration tribunals, and justice of the peace courts (julgados de paz).

The category of courts provided for in the Constitution is developed by Law No. 62/2013 of 26 August, Law on the Organization of the Judicial System⁶⁵³ and by a set of other ordinary laws and regulations that determine not only how responsibilities among such categories of courts are divided but also specifically regulate within each category of court how they are organized and shall exercise their competences.

Before a legal action is submitted to the court, one has to determine the specific court before which the case shall be presented, considering the subject and the area of law that is involved,⁶⁵⁴ the hierarchy of the tribunal,⁶⁵⁵ and the territorial location of the court.⁶⁵⁶ It is also important to determine the economic value of the cause. This is an amount express in euros⁶⁵⁷ that has influence in determining the concrete court before which the case shall be lodged, as well as in terms of appeal. Appealing is the reason that also justifies the existence of hierarchy.

Conflicts over unmanned vessels and UMs may occur in different situations, involving cases where different categories of courts may be called upon to intervene. Ultimately, the court that is competent to solve a dispute over unmanned vessels and UMs depends on how the case is designed by the plaintiff.

This section provides a general overview of the categories of courts in the Portuguese legal system that may be involved in dispute resolution over unmanned vessels and UMs, notably the courts of law, administrative courts, maritime courts, and arbitral tribunals. Further, this section also analyzes the domestic rules for assessing evidence collected by UMs.

653 Law No. 62/2013, of 26 August approves the Law of the Organization of the Judicial System; this law was amended 9 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1974&tabela=leis

654 *Ibid.*, Article 40.

655 *Ibid.*, Article 42.

656 *Ibid.*, Article 43.

657 *Ibid.*, Article 41.

1.1. Courts of law

The courts of law are the general courts in civil and criminal matters.⁶⁵⁸ This category comprises courts of first instance that may have specific competencies or are specialized in certain matters,⁶⁵⁹ such as labor, family, and commercial matters. It includes courts of second instance⁶⁶⁰ and the Supreme Court of Justice that is at the top of the hierarchy.⁶⁶¹

Courts of law have competence to decide cases that are not assigned to any other category of courts.⁶⁶² This is a residual competence, in the sense that if other courts decide that they cannot deal with the case, courts of law shall do. Courts of law exist in different parts of the Portuguese territory, which is divided into 23 districts (*comarcas*) for judicial purposes.⁶⁶³ Within these districts more than one court of first instance may exist, since they are divided into tribunals with generic competence and tribunals with specialized competence.⁶⁶⁴ There are five courts of second instance in Lisbon, Porto, Coimbra, Guimarães, and Évora, and one Supreme Court of Justice with headquarters in Lisbon.

In principle, cases are lodged before courts of law of first instance, but in exceptional circumstances, they can be submitted to the second instance and even to the Supreme Court of Justice directly, which decided questions of law and does not address facts.⁶⁶⁵ Procedures to be observed in the preparation and submission of a case before a court of law are set forth in the Code of Civil Procedures (CPC).⁶⁶⁶

1.2. Maritime courts

Maritime courts are not a separate category of courts but rather are integrated within the courts of law category.⁶⁶⁷ Maritime courts are courts of first instance, with specialized competence in maritime issues. Despite the law determining that maritime

658 Article 211(1) CRP.

659 *Ibid.*, Article 211(2).

660 *Ibid.*, Article 210(4).

661 *Ibid.*, Article 210(1).

662 Article 40(1) Law No. 62/2013, of 26 August (n 653).

663 *Ibid.*, Article 43.

664 *Ibid.*, Article 81.

665 *Ibid.*, Article 46.

666 Law No. 41/2013, of 26 June approves the CPC; the CPC was amended 9 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=1959&tabela=leis.

667 Article 1, Law No. 35/86, of 4 September regarding maritime courts, available at <https://dre.pt/application/file/a/220039>.

courts must be created in Lisbon, Leixões, Funchal, and Ponta Delgada,⁶⁶⁸ so far, there is only one maritime court installed in Lisbon that covers all the national territory.

The jurisdiction of the maritime courts comprises:

- Maritime waters, as well as the internal waters, seabed and margins, subject to the jurisdiction of the captaincies of ports and maritime delegations;⁶⁶⁹
- Port zones, shipbuilding, and ship repairing areas, as well as areas where fishing gears are placed or any other area with maritime installations such as ‘secas’ ‘tiradouros’, etc;⁶⁷⁰
- Any other areas, in accordance with the law.⁶⁷¹

Maritime courts have specialized competence in civil matters that cover the following cases and situations:

- Compensations to be paid as a result of damage caused by or suffered from vessels, ships, or any other floating devices as a result of their maritime use, in accordance with the law;⁶⁷²
- Construction and repair contracts, contracts of sale or purchase regarding vessels, ships, or any other floating devices, provided that they are aimed at having a maritime use;⁶⁷³
- Maritime transport contracts or combined or multimodal transport contracts;⁶⁷⁴
- Transport contracts on rivers or channels, in accordance with the annex I of Decree-Law No. 265/72, of 31 July;⁶⁷⁵
- Contracts about maritime use of vessels, ships or any floating devices, notably chartering or leasing;⁶⁷⁶

668 *Ibid.*, Article 1(2).

669 Article 3(a) Law No. 35/86, of 4 September (n 667).

670 *Ibid.*, Article 3(b).

671 *Ibid.*, Article 3(c).

672 Article 4(a) Law No. 35/86, of 4 September (n 667); article 113(1)(a), Law No. 62/2013, of 26 August (n 653).

673 *Ibid.*, Article 4(b); *Ibid.*, Article 113(1)(b).

674 *Ibid.*, Article 4(c); *Ibid.*, Article 113(1)(c).

675 *Ibid.*, Article 4(d); *Ibid.*, Article 113(1)(d).

676 *Ibid.*, Article 4(e); *Ibid.*, Article 113(1)(e).

- Insurance contracts over vessels, ships or floating devices and the cargo thereof, provided that they are intended to have a maritime use;⁶⁷⁷
- Mortgages and privileges over vessels or ships as well as collateral over floating devices and the cargo;⁶⁷⁸
- Special procedures regarding vessels, ships or over other floating devices and the cargo;⁶⁷⁹
- Interim measures regarding vessels, ships, and other floating devices, their cargo and bunkers, as well as other value relevant to vessels, ships and floating devices, as well as regarding the request that is made to the port captaincy to hold the assets that are subject to interim measures;⁶⁸⁰
- General and particular failures, including those referring to other floating devices that are aimed at having a maritime use;⁶⁸¹
- Maritime rescue and salvage;⁶⁸²
- Towage and piloting contracts;⁶⁸³
- Wreckage removal;⁶⁸⁴
- Civil liability suits as a result of pollution of the sea in areas under national jurisdiction;⁶⁸⁵
- Utilization, loss, finding or appropriation of fishing gears, gears used to catch shellfish, molluscs, and marine plants, irons, as well as other materials and objects that are aimed at supporting navigation or fishing and damages caused by the same material;⁶⁸⁶

677 *Ibid.*, Article 4(f); *Ibid.*, Article 113(1)(f).

678 *Ibid.*, Article 4(g); *Ibid.*, Article 113(1)(g).

679 *Ibid.*, Article 4(h); *Ibid.*, Article 113(1)(h).

680 *Ibid.*, Article 4(i); *Ibid.*, Article 113(1)(i).

681 *Ibid.*, Article 4(j); *Ibid.*, Article 113(1)(j).

682 Article 113 (l), (k), Law No. 62/2013, of 26 August (n 653).

683 Article 4(m), Law No. 35/86, of 4 September (n 667); Article 113(1)(l), Law No. 62/2013, of 26 August (n 653).

684 *Ibid.*, Article 4(n); *Ibid.*, Article 113(1)(m).

685 *Ibid.*, Article 4(o); *Ibid.*, Article 113(1)(n).

686 *Ibid.*, Article 4(p); *Ibid.*, Article 113(1)(o).

- Damages caused to assets which are part of the maritime public domain;⁶⁸⁷
- Ownership and possession over things or part of things coming from the sea waters that remain in the seabed or that coming from or exist in internal waters, when there is a maritime interest;⁶⁸⁸
- Maritime detentions;⁶⁸⁹
- All general questions regarding maritime commercial law;⁶⁹⁰
- Appeal from the decision of the port captain within maritime penalties.⁶⁹¹

As it can be concluded, maritime courts have a very broad competence when it comes to civil matters regarding maritime affairs. Several issues discussed throughout this report would fall within the competence of maritime courts, such as compensation in case of damage or pollution, towage and piloting contracts, among others. The broad reference that is made, in several paragraphs, to floating devices suffices to include any case that involves compensation to be paid as a result of damages caused by unmanned vessels and UMVs. Therefore, despite the absence of reference to unmanned vessels and UMVs, it can be argued that disputes over them can be submitted before maritime courts provided that they are, somehow, related to their maritime use.

As a result of being integrated into the court of law category, procedures to be observed in the preparation and submission of a case before a maritime court are those set forth in the CPC.⁶⁹² Moreover, appeals from decisions of the maritime court shall be submitted to the second instance of court of law and to the Supreme Court of Justice.

1.3. Administrative and tax courts

Administrative and tax courts are a category of courts with competence in matters regarding disputes arising from administrative and fiscal relationships.⁶⁹³ This category of courts also comprises courts of first instance,⁶⁹⁴ of second instance⁶⁹⁵ and the Supreme Administrative Court that is at the top of the hierarchy.⁶⁹⁶

687 *Ibid.*, Article 4(q); *Ibid.*, Article 113(1)(p).

688 *Ibid.*, Article 4(r); *Ibid.*, Article 113(1)(q).

689 *Ibid.*, Article 4(s); *Ibid.*, Article 113(1)(r).

690 *Ibid.*, Article 4(t); *Ibid.*, Article 113(1)(s).

691 *Ibid.*, Article 5; *Ibid.*, Article 113(1)(t).

692 Law No. 41/2013, of 26 July (n 667).

693 Article 212(3) CRP; Article 144(1) Law No. 62/2013, of 26 August (n 653).

694 Article 148 Law No. 62/2013, of 26 August (n 653).

695 *Ibid.*, Article 147.

696 Article 212(1) CRP; *Ibid.*, Article 146.

Contrary to courts of law, which have a residual competence, administrative and tax courts are courts that only address cases that are specially included in their scope of jurisdiction. The Statute of the Administrative and Tax Courts (ETAF)⁶⁹⁷ provides a list of matters that are included⁶⁹⁸ and excluded⁶⁹⁹ from the jurisdiction of this category of courts.

The Supreme Administrative Court is at the top of the hierarchy and it has its headquarters in Lisbon.⁷⁰⁰ In Portuguese territory, there are two administrative and tax courts of second instance and 16 courts of first instance. In principle, cases lodged before administrative and tax courts are submitted to the first instance. However, both the second instance⁷⁰¹ and the Supreme Administrative Court,⁷⁰² which by default, work as courts of appeal, have exceptional competence to received cases of first instance. Procedures to be observed in the preparation and submission of a case before administrative and tax courts are set forth in the Code of Administrative Courts Procedures (CPTA).⁷⁰³ The CPC is also applicable to all issues that are not specifically regulated by the CPTA,⁷⁰⁴ notably regarding submission and assessment of evidence.

Despite the extensive list of situations that are under the umbrella of maritime courts, there are some cases that may be submitted before administrative courts. These cases include decisions regarding the safety of navigation or any other technical and administrative decision taken by the captain of the port. The captain of a port is the local representative of the AMN and many of her or his decisions are taken under administrative law, and shall be challenged directly before administrative courts.⁷⁰⁵

1.4. Arbitral tribunals

The Portuguese legal order permits that parties in a dispute, in certain circumstances, submit the case to an arbitral tribunal created for that effect or to an institution-

697 Law No. 13/2002, of 19 February approves the Statute of the Administrative and Tax Courts. ETAF was amended 14 times, an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=418&tabela=leis.

698 *Ibid.*, Article 4(1).

699 *Ibid.*, Article 4(3)(4).

700 Article 212(1) CRP; Article 146 Law No. 62/2013, of 26 August (n 653); Article 11 ETAF (n 697).

701 Article 37, ETAF (n 697).

702 *Ibid.*, Article 24.

703 Law No. 15/2002, of 22 February, approves the procedures to be observed before administrative courts or the CPTA, which was amended 6 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=439&tabela=leis&so_miolo=.

704 *Ibid.*, Article 1.

705 R G Fonseca, 'O Capitão do Porto' in M J da Costa Gomes (coord), *IV Jornadas de Lisboa de Direito Marítimo, O Porto*, (Almedina, Lisboa, 2018), 559-571, at p. 564.

alized arbitration court. The legal regime that regulates arbitral tribunal created as a result of the will of the parties is regulated in Law No. 63/2011, of 14 December.⁷⁰⁶

For a dispute resolution to be submitted before an arbitral tribunal, the following requirements shall be in place:

- The case shall not be submitted by law to courts of the State or to mandatory arbitration.⁷⁰⁷ If there is a law determining that the case is to be decided by courts of the State, the arbitration is not possible. The maximum example would be a murder case, that can only be decided by courts of the State;
- The case needs to have a patrimonial nature or if no patrimonial interest is involved, the parties shall have the power to terminate the case as and whenever they wish, even when the trial before a court of the State is ongoing.⁷⁰⁸ This excludes from arbitration, for instance, any litigation regarding personal rights;
- A written arbitration agreement shall exist.⁷⁰⁹ This document can be signed when the process is already being processed by a court of the State or prepared in advance, to regulate a future litigation.⁷¹⁰

The arbitral tribunal consists of one or several arbitrators⁷¹¹ appointed by the parties,⁷¹² who are also entitled to decide the place for the arbitration to take place,⁷¹³ as well as the language to be used.⁷¹⁴ The parties are entitled to agree on specific rules to be observed by the arbitrators while conducting the case towards the decision, provided that the mandatory principles and rules enshrined in Law No. 63/2011, of 14 December are respected.⁷¹⁵

By default, the arbitrators decide the case in accordance with the law in force, unless parties otherwise decide,⁷¹⁶ and the decision is final and binding. Appeals to

706 Law No. 63/2011, of 14 December regarding voluntary arbitral tribunals, available at <https://dre.pt/aplicacao/file/a/145443>.

707 *Ibid.*, Article 1(1).

708 *Ibid.*, Article 1(1)(2).

709 *Ibid.*, Article 2(1).

710 *Ibid.*, Article 1(3).

711 *Ibid.*, Article 8(1).

712 *Ibid.*, Article 10(1).

713 *Ibid.*, Article 31(1).

714 *Ibid.*, Article 32(1).

715 *Ibid.*, Article 30(2).

716 *Ibid.*, Article 39(1).

the courts of the State are only possible when the parties expressly determine this possibility in the arbitration agreement, when the decision was made based on the law and not based on arguments of fairness and if no agreement is reached by the parties.⁷¹⁷ A case submitted before an arbitral tribunal shall be decided within 12 months from the date of acceptance by the last arbitrator.⁷¹⁸

Arbitration can also be developed in institutionalized centers approved by the Minister of Justice. Centers may cover the national territory or just part of it as well as being specialized in general or specific matters. A full list of centers is available online.⁷¹⁹ Institutionalized arbitration that addressed administrative issues is also available.⁷²⁰

2. The use of evidence collected by UMs by national courts

In theory, evidence collected in the marine environment by UMs may be submitted before any court. However, in practice what is relevant to assess are the rules to present evidence provided for in the CPC and in the Code of Criminal Procedures (CPP).⁷²¹ The CPC sets forth the rules and procedures regarding admissibility and assessment of evidence directly applicable to civil cases and, when necessary, to other areas, such as maritime and administrative cases. Proceedings before arbitral tribunals are defined by the parties, but very often rules regarding the assessment of evidence also follow the CPC procedures. The CPP establishes rules for court procedures dealing with criminal issues.

In any case, what is relevant discussing is the adjective rules that define the pleading and the procedures by which the substantive law is applicable in practice. Substantive rules, which define rights, duties, and liabilities and provide the basis for the decision on the merit of the case are not analyzed.

⁷¹⁷ *Ibid.*, Article 39(4).

⁷¹⁸ *Ibid.*, Article 39(4).

⁷¹⁹ See Ministry of Justice webpage, available at http://www.dgpi.mj.pt/sections/gral/arbitragem/anexos-arbitragem/centros-de-arbitragem4174/downloadFile/attachedFile_f0/Lista_CA_autorizados_MJ.pdf?nocache=1529422883.02.

⁷²⁰ See the Administrative Arbitration Centre (*Centro de Arbitragem Administrativa*), available at <https://www.caad.org.pt/legislacao>;

⁷²¹ Decree-Law No. 78/87, of 17 February that approves the CPP, which has been amended 40 times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdilisboa.pt/leis/lei_mostra_articulado.php?nid=199&tabela=leis&so_miolo=.

2.1 Civil cases

2.1.1 Admissibility

The evidence collected by UMMVs may be submitted in the category of documentary evidence.⁷²² Documentary evidence is defined in an extensive way⁷²³ as any evidence that results from a document. A document is an object prepared by humans to reproduce or represent a person, a thing or a fact.⁷²⁴ This may include contracts, declarations, letters, photos, charters, or any other written statement. Documents may be private or authentic. Authentic documents are those enacted by a public authority, within the limits of its competence and within the formalities that are imposed by law for such document.⁷²⁵ Private documents are the remaining ones that may be authenticated when what they contend is confirmed by the parties in accordance with notarial rules.⁷²⁶ A photo that is taken by a UMMV, a charter that reproduces data of the marine environment that is generated based on the information electronically transmitted by a UMMV is a documentary evidence. In both cases, the document speaks for itself because once it is presented, it can be assessed *per se*.⁷²⁷

The situation is different when a video or a sound record is involved. Article 428 of the CPC also integrates within the category of documentary evidence any exhibition of video or sound that is to be used as a means of proof, but in this case, for the document to be reproduced an external object that enables its reproduction is necessary.⁷²⁸ The information may be saved on a USB, in an external memory device, on a CD, but a computer needs to be used for the information to be accessed. The party that intends to present any video or sound taken by the UMMV has to provide the tribunal with all the technical means for the video and sound to be produced. The other party shall be notified that a video or sound was submitted as evidence and is entitled to examine, to see or to listen the evidence.⁷²⁹

722 Articles 423 to 451, CPC (n 666).

723 L F P Sousa, *O Valor Probatório do Documento Eletrónico no Processo Civil*, (2.ª ed. Almedina, Coimbra 2017), at p. 9.

724 Article 362 CC (n 480).

725 *Ibid.*, Article 363(2).

726 *Ibid.*, Article 363(3).

727 Sousa (n 723), 12.

728 *Ibid.*

729 F P Rodrigues, *Os Meios de Prova em Processo Civil*, (3.ª ed., Almedina, Coimbra, 2017), at p. 109.

There are already some examples of civil cases where the tribunal admitted as evidence, videos submitted by the parties.⁷³⁰ The type and category of device from where the video is recorded does not seem to be relevant. Therefore, it can be argued that the use of UMGs shall be treated as any other technological device.

Evidence collected by UMGs that is rejected by the tribunal, legitimates the party that presented the evidence to apply to the court of appeal immediately.⁷³¹ However, it shall be mentioned that when evidence collected by UMGs violates fundamental rights, notably the right to image there is a chance that its use may be refused. It can be argued that Article 32(8) of the CRP that considers null and void evidence collected and submitted in criminal cases with violation of some fundamental rights shall be applicable to civil cases by analogy.⁷³²

2.1.2 The value of evidence collected by UMGs

In terms of appreciation of the evidence submitted, the general principle that applies is the principle of free assessment of evidence that determines that the judge assesses the evidence in accordance with his or her own conviction, unless one of the following exceptions apply: *i)* the law requires special procedures to be observed to prove a certain fact; *ii)* the fact can only be proven by document; or *iii)* when the fact is proven by agreement of the parties or due to a confession.⁷³³

Photos taken by UMGs or graphic charts produced as a result of the information transmitted by electronic means, as well as other evidence such as videos or sound recordings that are captured by UMGs are mechanical reproductions subject to Article 368 of the CC. As a result, they constitute proof of the facts they represent. This means that if a video captured by a UMG is presented by the plaintiff and the defendant does not contest the video, the judge shall consider that the facts reproduced in the video are true and proven. The defendant has the burden to contest⁷³⁴ the reproduction presented and he or she shall do so in a very clear and explicit way, notably saying that the reproduction is not original either because the UMG used was

730 See, for instance, Court of Appeal of Porto, Process 1928/07.2TBVRL-B.P1 (03/11/2014), available at <http://www.dgsi.pt/jtrp.nsf/56a6e7121657f91e80257cda00381fdf/c331599fd9143a8380257d94004ceb6a?OpenDocument>; accessed 21 August; and Court of Appeal of Lisboa, Process 13559/09.8T2SNT-A.L1-6 (31/03/2011), available at <http://www.dgsi.pt/jtrl.nsf/33182fc732316039802565fa00497eec/a1b49b17244111688025789d0049a7df?OpenDocument>.

731 Article 644(2)(d) CPC (n 666).

732 Court of Appeal of Evora, Process No. 8346/16.0T8STB-B.E1 (11/05/2017), available at <http://www.dgsi.pt/jtre.nsf/134973db04f39bf2802579bf005f080b/f1f1a6efdce317398025812400566ed9?OpenDocument>.

733 Article 607(5) CPC (n 666).

734 *Ibid.*, 444(1).

adulterated or that the reproduction was changed electronically or even claiming that the video was produced electronically and does not correspond to the truth.⁷³⁵

When videos, sounds recordings or any other mechanical reproductions are contested by the defendant, they do not represent full evidence of the facts but they can still be considered within the context of judicial presumption.⁷³⁶ A judicial presumption is a proof admitted in Article 351 of the CC that enables the judge, based on a proven or known fact and applying the maxims of experience, to conclude the existence of another fact that it is not known.

A relevant aspect to consider is that the Portuguese legislation does not stipulate that original videos or sounds recordings shall be submitted. It seems that copies shall be provided with the same value as the original ones. It is not relevant either who is the author of the document, what it does matter is the representation provided for in the video and not who captured it.⁷³⁷

2.2 Criminal cases

2.2.1 Admissibility

In criminal cases, the evidence collected by UMVs may be submitted in the category of documentary evidence.⁷³⁸ Documents are also defined in a wide way in order to include any declaration, signal or note that is provided in writing or in any other technical means, in accordance with criminal law.⁷³⁹ The difference between private and authentic documents previously explained also apply in criminal cases,⁷⁴⁰ along with what has been said regarding the need to provide the court with mean for reproduction of a video or a sound recording. Whether on a USB or an external memory, or a CD, the court needs to have access to the file, which shall be provided by the prosecutor responsible for conducting the investigations or by the defendant, according to the case.

The CPP itself clearly recognizes the possibility of mechanical reproductions to

⁷³⁵ Sousa (n 723), at p. 89.

⁷³⁶ *Ibid.*

⁷³⁷ *Ibid.*, at p. 90.

⁷³⁸ Articles 164 to 170 CPP (n 721).

⁷³⁹ *Ibid.*, Article 164(1).

⁷⁴⁰ S Cabral 'Artigo 164' in A H Gaspar et al, *Código de Processo Penal Comentado* (Almedina, Coimbra 2014), 69- 1695, at p. 694.

be presented as evidence, provided that they are not considered illegal, in accordance with the criminal law.⁷⁴¹

There are many cases before Portuguese courts dealing with criminal matters that involve videos and sounds captured by public and private video surveillance systems and wiretapping. These examples can be analyzed and used to predict what would be the position of Portuguese criminal courts before evidence captured by UMs, notably videos and sound recordings.

In principle, images captured in a commercial area by private video surveillance systems are not considered illegal evidence, even when the Portuguese Data Protection Authority has not authorized the capture.⁷⁴² The capture of images of persons without their authorization can be legally used as evidence when there is a reason to justify it, notably when the capture is carried out in a public space or justified by a reason of public interest.⁷⁴³ It is understood that photos or videos involving persons do not interfere with their privacy, because they are mainly used to identify those who are committing a crime. Therefore, the capture is justified.⁷⁴⁴ This is also the reason why images or sounds recorded without the authorization of the person can be used, despite the fact Article 199 of the Penal Code declares it a crime.⁷⁴⁵

If this position is adopted by courts towards video surveillance systems and applies both to images and videos captured in private and public places, there is no reason for courts to exclude those which are captured by UMs. It is not the device used for capturing the image that matters but rather the purpose for which images and videos are used for.

Sound recorded by UMs shall, in principle, be subject to the same legal regime that is established by wiretapping.⁷⁴⁶ Hence, besides complying with the criminal law provisions, sounds captured by UMs shall also observe the procedures set forth from Article 171 to 190 of the CPP.

741 Article 125, CPP (n 721).

742 Court of Appeal of Coimbra, Process 167/15.3PBVF.C1, (20/9/2017), available at <http://www.dgsi.pt/jtrc.nsf/8fe0e606d8f56b22802576c0005637dc/7c706750da1160bf802581a3003bfaf2?OpenDocument>.

743 Court of Appeal of Porto, Process 349/13.2PEGDM.P1 (25/2/2015), available at <http://www.dgsi.pt/jtrp.nsf/56a6e7121657f91e80257cda00381fdf/d990fbcd9e79f47b80257e0400549da7?OpenDocument>.

744 Court of Appeal of Évora, Process 2499/08.8TAPTM.E1 (28/6/2011), available at <http://www.dgsi.pt/jtre.nsf/134973db04f39bf2802579bf005f080b/2fb889a910778fe880257de10056f5bc?OpenDocument>.

745 Supreme Court of Appeal, Process 22/09.6YGLSB.S2 (28/09/2011), available at <http://www.dgsi.pt/jstj.nsf/954f0ce6ad9dd8b980256b5f003fa814/25cd7aa80cc3adb0802579260032dd4a?OpenDocument>; see also S Cabral 'Artigo 167' in A H Gaspar et al, *Código de Processo Penal Comentado* (Almedina, Coimbra 2014), 701-713, at p. 704; and Decree-Law No. 48/95, of 15 March that approves the Penal Code, which has been amended many times; and updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=109&tabela=leis.

746 Article 189, CPP (n 721).

Wiretapping is only admitted in certain categories of crimes. There are certain crimes, which may be carried out on the ocean, that can be subject to wiretapping for which UMMVs may be used for, such as: drug⁷⁴⁷ and weapons trafficking,⁷⁴⁸ smuggling,⁷⁴⁹ terrorism,⁷⁵⁰ crimes regulated in maritime and aerial safety conventions,⁷⁵¹ and eventually others. For the wiretapping to be legal, some reasons shall exist to consider that the wiretapping is essential to discover the truth or that the evidence will be very hard or impossible to obtain without it.⁷⁵² In addition, the realization of wiretapping needs to be previously authorized by the judge⁷⁵³ against a suspect or a defendant⁷⁵⁴ or against those acting as an intermediary where there are good reasons to believe that they receive or transmit messages from a suspect or a defendant,⁷⁵⁵ and even against the victim.⁷⁵⁶ If the procedures are not observed, the evidence captured is null and void.⁷⁵⁷

In terms of admissibility, it seems that evidence collected by UMMVs can be legally submitted under the CPP dispositions, but their admission is not straightforward. It depends, as explained, on compliance with the several legal requirements imposed for its capture. It is a fact that the judicial decision that refuses the use of evidence collected by UMMVs can be subject to appeal immediately,⁷⁵⁸ but it would be more appropriate to have an amendment to the law that would introduce clarifications on the submission of evidence collected by new technological means, where UMMVs would be included.

2.2.2 The value of evidence collected by UMMVs

In criminal cases, presentation and assessment of evidence is a key element that is regulated with certain details in the CPP, especially during the trial phase.⁷⁵⁹ All facts that are legally relevant and contribute to discovering the existence or non-existence of a crime, the punishment or non-punishment of the accused, an determining of the sentence are the object of evidence.⁷⁶⁰

747 *Ibid.*, Article 187(1)(b).

748 *Ibid.*, Article 187(1)(c).

749 *Ibid.*, Article 187(1)(d).

750 *Ibid.*, Article 187(2)(a).

751 *Ibid.*, Article 187(2)(f).

752 *Ibid.*, Article 187(1).

753 *Ibid.*, Article 187(1).

754 *Ibid.*, Article 187(4)(a).

755 *Ibid.*, Article 187(4)(b).

756 *Ibid.*, Article 187(4)(c).

757 *Ibid.*, Article 190.

758 *Ibid.*, Articles 400(1), *a contrario sensu*, and 406(2).

759 *Ibid.*, Article 355.

760 *Ibid.*, Article 124.

The general principle that applies in terms of appreciation of evidence is the principle of free assessment of evidence in accordance with the experience and conviction of the judge unless it is otherwise imposed by law.⁷⁶¹ Photos taken by UMGs or charts presented that were elaborated based on information transmitted by UMGs are documentary evidence for which the law does not impose any requirement in terms of admissibility. So once they are admitted in the process, they are assessed by the judge in accordance with his or her experience and conviction,⁷⁶² unless authentic documents are submitted. In this case, the judge can only question and discuss their authenticity or veracity.⁷⁶³ The same principle applies in the case of video or any other mechanical reproduction that is admitted in the process.⁷⁶⁴ In the award, the judge needs to justify his or her conviction, shall analyze all evidence produced critically, and shall indicate the facts that are proven and those which are not proven that justified his or her position.⁷⁶⁵

2.3 The use of evidence collected by UMGs in maritime related offenses

The ocean can be used to practice several types of offenses, such as offenses related to safety of navigation, offences regarding pollution of the maritime environment as well as fisheries offences. Overall, these are mainly administrative offences that violate the rules and regulations imposed by sectorial national laws.

Maritime related offences are mainly set forth in the following legal instruments:

- **Decree-Law No. 35/2019, of 11 March that defines the penalty legal regime that applies to commercial fishing activities**⁷⁶⁶ – This recently approved legal framework establishes the legal regime that regulates the penalty legal regime that applies to commercial fishing activities carry out in national territory, in the internal waters, in the territorial sea, in the EEZ, on the high seas and on the waters of the EU.⁷⁶⁷ It provides rules and regulations for control, inspection and surveillance of commercial fishing activities and determines a list of administrative fines applicable to administrative offenses in this sector. This

⁷⁶¹ *Ibid.*, Article 127.

⁷⁶² *Ibid.*

⁷⁶³ ‘Artigo 127’, Magistrados do Ministério Público do Distrito Judicial do Porto, *Código de Processo Penal Comentários e notas práticas* (Coimbra Editora, 2009), 335-346, at p. 334.

⁷⁶⁴ Article 127, CPP (n 721).

⁷⁶⁵ *Ibid.*, Article 374(2).

⁷⁶⁶ Decree-Law No. 35/2019, of 11 March that defines the penalty legal regime that applies to commercial fishing activities, available at <https://dre.pt/application/file/a/120707415>.

⁷⁶⁷ *Ibid.*, Article 2.

legal instrument contains a very important disposition regarding evidence. Article 6(1)(h), when regulating the powers of fisheries inspectors clearly determines that they are entitled to take photos, make video recordings to weigh and to measure whatever is necessary as well as to carry out any technical investigation that it might be important for the case. There are no restrictions to the use of certain types of devices to capture such photos and video recordings. For this reason, it seems that it is possible to present as a proof photos and video recordings captured by UUVs.

- **Decree-Law No. 45/2002, of 2 March, which defines the legal regime applicable to maritime offenses under the jurisdiction of the AMN**- this legal framework sets forth a list of administrative offenses and fines that are under the jurisdiction of the AMN,⁷⁶⁸ determines the interim measures⁷⁶⁹ as well as the maximum amount of fines⁷⁷⁰ and other additional sanctions that may be placed.⁷⁷¹ Few other specific rules are imposed by this legal framework, but information on the evidence collected to attest the facts is not provided. It is only mentioned that the maritime police shall use interim and other measures to ensure that evidence collected is protected.⁷⁷² This legal framework is complemented⁷⁷³ by Decree-Law No. 433/82, of 27 October that defines the general legal regime of administrative offences.⁷⁷⁴ However, this legal instrument does not provide guidance on evidence, but requires that an administrative decision that imposes an administrative fine shall clearly indicate the facts and proof that were obtained.⁷⁷⁵
- **Decree-Law No. 235/2000, of 26 September that establishes the legal regime regulating administrative offenses in case of marine pollution**- a list of administrative offenses regarding pollution to the marine environment are provided for,⁷⁷⁶ as well as the maximum amount of the fine that can be

⁷⁶⁸ Article 4, Decree-Law No. 45/2002, of 2 March (n 466).

⁷⁶⁹ *Ibid.*, Article 8.

⁷⁷⁰ *Ibid.*, Article 4.

⁷⁷¹ *Ibid.*, Article 9.

⁷⁷² *Ibid.*, Article 10(2).

⁷⁷³ *Ibid.*, Article 12.

⁷⁷⁴ Decree-Law No. 433/82, of 27 October was amended several times; an updated version is provided by the Procuradoria-Geral Distrital de Lisboa webpage, available at http://www.pgdlisboa.pt/leis/lei_mostra_articulado.php?nid=166&tabela=leis.

⁷⁷⁵ *Ibid.*, Article 58(1)(b).

⁷⁷⁶ Article 4 Decree-Law No. 235/2000, of 26 September, which establishes the legal regime regulating administrative fines in case of pollution of the marine environment, available at <https://dre.pt/application/file/a/560303>.

imposed,⁷⁷⁷ along with specific rules regarding the assessment of the pollution and its origins. This legal framework determines that the captain of the port is the authority⁷⁷⁸ with the competence to implement the procedures in order to apply the fine, and also imposes that necessary investigations of a marine accident shall be carried out by the Navy in collaboration with the entity that has under its umbrella the safety of vessels, as well as any other relevant entity.⁷⁷⁹ There is no dispositions regarding evidence. This legal framework is also complemented⁷⁸⁰ by Decree-Law No. 433/82, of 27 October that defines the general legal regime of administrative offences.⁷⁸¹

777 *Ibid.*, Articles 7 and 11.

778 *Ibid.*, Article 11(1).

779 *Ibid.*, Article 13(2).

780 *Ibid.*, Article 22(2).

781 Decree-Law No. 433/82, of 27 October (n 774).

Chapter 5

RECOMMENDATIONS TO IMPROVE THE PORTUGUESE LEGAL SYSTEM TO PROMOTE THE USE OF UNMANNED VESSELS AND UMMs IN WATERS UNDER PORTUGUESE SOVEREIGNTY AND JURISDICTION

1. Amendments to key legal frameworks

This report has analyzed the legal regime that applies to unmanned vessels and UMMs in the Portuguese legal order. It has pointed out several legal frameworks that are likely to apply to the operations of unmanned vessels and UMMs, and it has also identified several amendments that shall be prepared in order to provide the core foundations for unmanned vessels and UMMs to operate in waters under Portuguese sovereignty and jurisdiction. It is relevant to keep in mind that some amendments that are going to be suggested require technical discussion. Accordingly, when it is possible, clear indications regarding the direction of the amendment are provided. When, due to technical implications, such concrete indication is not possible, areas that shall be technically discussed are identified.

1.1 Definition of the basic legal framework for unmanned vessels

In order to define the basic legal framework for unmanned vessels, amendments to the following legislation are necessary:

- **Decree-Law No. 201/98, of 10 July that approves the legal statute of the ship**⁷⁸² - it can be introduced in Article 1, a small amendment that clearly recognizes the category of unmanned vessels. For instance, Article 1(1) can be amendment as follows: *‘For the purposes of this Decree-Law, a ship is a floating vessel manned or unmanned intended for water navigation.’* Alternatively, a new paragraph can be introduced in Article 1, stating that *‘this legal framework applies, with necessary adaptations, to unmanned ships.’*
- **Decree-Law No. 2/2017, of 6 January that establishes the legal regime of the entrance of foreign warships, aircrafts and foreign land forces in the Portuguese territory**⁷⁸³ - for unmanned warships to be able to enter into the Portuguese territory, amendments may be introduced in order to recognize that unmanned warships can be under the command of a distance-based official, whose the name is listed in the official registration of the Navy. The definition provided for in Article 3(e)(i)(iii)(iii) shall be amended in order to introduce after the word under *‘command’* the expression or *‘under command, by remote means, of a distance-based official.’* In addition, a list of technical information that shall be given to the authorities for the unmanned State vessel to be admitted to enter into national ports is necessary. Hence, amendments to Article 17 shall be technically discussed. Article 27 shall also be amended in order to include besides small vessels, UUVs as well. The same approach shall be adopted with regard to Article 29 in order to include UUVs.
- **Decree-Law No. 265/72, of 31 July, which approves the General Regulation of Captaincies**⁷⁸⁴ - chapter III needs to introduce a new classification of vessels considering their manned or unmanned nature. A new Article may be created that classifies vessels in accordance with their manned or unmanned nature. If exceptions to registration of small unmanned vessels that navigate close to the territorial sea are going to be introduced, a new provision in Chapter V shall be drafted.

782 Decree-Law No. 201/98, of 10 July (n 385).

783 Decree-Law No. 2/2017, of 6 January (n 426).

784 Decree-Law No. 265/72, of 31 July (n 392).

- **Decree-Law No. 43/2018, of 18 July that created the BMAR registration,⁷⁸⁵ Decree-Law No. 92/2018, of 13 November,⁷⁸⁶ which introduced a special tonnage tax regime in Portugal, Decree-Law No. 96/89, of 2 March,⁷⁸⁷ which creates the Madeira's International Shipping Registry, and Order (Portaria) No. 715/89, of 23 August⁷⁸⁸ that establishes the regulations for shipping registration in Madeira shall be amended** - provisions shall be introduced regarding the information that shall be submitted in order to register unmanned vessels, notably information regarding technology employed for distance navigation, information regarding the activation of safety procedures in case of emergency, information regarding the distance-based master and crew and their training, as well as any other technical aspect that is relevant in accordance with discussions to be held by technical experts. Rules and guidelines for safety procedures for operation of unmanned vessels need to be technically discussed.

1.2 Definition of the legal regime of distance-based masters and crew

The current legislation in force was prepared for crew working on board. While it is recommended that a new legislation is passed that exclusively regulate distance-based masters and crew, some of the legal frameworks may require some amendments, while other are likely to apply directly to unmanned vessels, as follows:

- **Decree-Law No. 384/99, of 23 September that sets forth the legal regime regarding a ship's crew**⁷⁸⁹ - this legal framework will need be subject to several amendments since it was entirely prepared for manned vessels. The following amendments are suggested:
 - The concept of crew defined in Article 1(1) that requires crew to be on board. Under this legal regime, those who are able to perform remotely controlled activities in the vessel are not consider as crew. Hence, distance-based pilots and crew shall be introduced in the wording of this provision;

⁷⁸⁵ Decree-Law No. 43/2018, of 18 July (n 437).

⁷⁸⁶ Decree-Law No. 92/2018, of 13 November (n 394).

⁷⁸⁷ Decree-Law No. 234/2015, of 13 October (n 445).

⁷⁸⁸ Order (*Portaria*) No. 715/89, of 23 August (n 451).

⁷⁸⁹ Decree-Law No. 384/99, of 23 September (n 477).

- Article 1(3) defines safe manning as the minimum numbers of crew members, divided into categories and functions, defined as per each vessel, which ensures the safety of the crew, passengers, cargo, catches and the protection of the marine environment as well. This legal definition does not require that crew members shall be on board. Therefore, it might be apt to include distance-based ones. However, the numbers of the crew members and distance-based operators are likely to be subject to a different assessment when compared the one carried out to regular vessels;
- Article 1(2) establishes that the performance of any service on board of a vessel by non-seafarers is subject to license. It is important to discuss this issue in order to assess the certification of distance-based master and crew;
- In order to include in the concept of ‘crew’ distance-based masters, crew and operators, an amendment to Article 1 can be made in order to include for instance a new number 4 that determines that *‘the minimum number of the distance-based masters, crew, and operators of unmanned vessels as well as their roles and functions is determined in a proper legal framework, without prejudice to the application of this Decree-Law, with adaptations;’*
- The concept of captain provided for in Article 3 as well as her or his duties and functions established in Article 5 is broad enough to include remote captains. However, in accordance with Article 4, the pilot officer who supports the captain, is required to be on board. Accordingly, amendments to Article 4 are required;
- Article 6 that defines the obligations of the captain contains some provisions, that impose the presence on board, such as: i) paragraph d) requires the captain to remain on board particularly during the voyage when there is danger to the shipment; paragraph i) which states that the captain shall provide, in the event of abandonment of the ship, the salvage of ship’s documents, financial means and other valuables, which were entrusted to him; paragraph m), which establishes that the captain shall grant access to the ship for the purpose of surveys by accredited experts, provided that this does not involve losses to the ship. It is important to discuss whether or

not these obligations shall apply to distance-based captains and if so, how they can be complied with by using new technology;

- Article 12(2) sets forth that working contracts on board of vessels are regulated in special legislation. Recruitment of remote crew, operators or masters may also require special legislation, so an amendment to this Article is also suggested in order to include a paragraph 3, which establishes that working contracts for distanced based crew, captain or operators are subject to special legislation.
- **Decree-Law No. 7/2006, of 4 January that establishes the legal regime for transporting people and goods in maritime cabotage**⁷⁹⁰– it imposes, in Article 5(1)(i)(j), certain requirements regarding the nationality of crew as well as their remuneration. These paragraphs do not necessarily entail amendments. The requirements regarding the nationality of the distance-based crew may remain the same, as well as obligations to comply with the minimum remuneration. What probably needs to be discussed is the amount of remuneration that shall be paid to the crew that do not embark on the vessel but rather stays on land.
- **Decree-Law No. 96/89, of 28 March that creates MAR international registry**⁷⁹¹– requires that at least 30% of the crew of the vessels registered at MAR shall be citizens of Portugal or citizens of European countries or Portuguese Official Speaking Countries. This obligation can be, in theory, maintained to distance-based crew.
- **Decree-Law No. 265/72, of 31 July that approves the General Regulation of Captaincies**⁷⁹²– imposes several obligations on the master of the vessel regarding safety and rescue at sea, as well as obligations regarding the entry of the vessel in national ports. Articles 149, 150 and 151 impose that the ship's documents shall be kept by the master, who has the duty to present them to the authorities when requested, not only at sea but also when entering into a port. These are good examples of norms that, although established in national legislation, will require amendments but as a result of discussions held in proper international forums. Guidelines shall be in place to enable

790 Decree-Law No. 7/2006, of 4 January approves the legal regime for transporting people and goods in maritime cabotage available at <https://dre.pt/application/file/a/203501>; as amended by Decree-Law No. 137/2015, of 30 July, available at <https://dre.pt/application/file/a/69906416>.

791 Decree-Law No. 96/89, of 28 March, (445).

792 Decree-Law No. 265/72, of 31 July (n 392).

circulation of unmanned vessels across oceans and, simultaneously, to establish common procedures for these obligations to be complied with.

- **Decree-Law No. 48/2002, of 2 March establishes the legal regime of pilotage as a public service and approves its general regulations**⁷⁹³ - in Portugal, pilotage is a public service, although it can be delivered through concession.⁷⁹⁴ Pilotage consists in the technical assistance that is provided to the masters of the vessels by certified pilots in order to increase the safety of navigation.⁷⁹⁵ Decree-Law No. 48/2002, of 2 March establishes that there are certain areas close to the ports and normally up to 2 nautical miles offshore where pilotage is mandatory.⁷⁹⁶ Exceptionally, certain vessels, such as warships, navy vessels and auxiliaries, vessels of the maritime port authority, local vessels, local tugboats, and local auxiliary vessels, which are temporarily authorized to exercise their activity in a local area, vessels under command of a certified master, among others, are exempt from mandatory pilotage.⁷⁹⁷ Mandatory pilotage is an important factor to consider while determining the legal regime of unmanned vessels. The first point that needs to be discussed is the imposition of mandatory pilotage to unmanned vessels. If it can be conceived that once on the ocean, unmanned vessels may navigate without causing hazards to navigation, the assessment of the situation might be different close to the shore. The features of the coastline and the port itself, along with the maritime traffic that is observed in these areas may justify the imposition of mandatory pilotage to unmanned vessels. Moreover, it is also relevant discussing if unmanned vessels may be exempt from mandatory pilotage in any circumstance, *maxime*, when the shore-based master already has experienced in the area.⁷⁹⁸
- **Law No. 146/2015, of 9 September, which regulates the activity of seafarers on board of vessels flying the Portuguese flag**⁷⁹⁹ - this legal framework is a

793 Decree-Law no. 48/2002, of 2 March approves the legal regime of pilotage as a public service and approves its general regulations, available at <https://dre.pt/application/file/a/251899>.

794 S Aires, 'Porto e Pilotagem' in M J da Costa Gomes (coord), *IV Jornadas de Lisboa de Direito Marítimo, O Porto*, (Almedina, Lisboa 2018) 593-615, p. 595.

795 *Ibid.*, Article 1(1) Decree-Law No. 48/2002, of 2 March (n 793).

796 *Ibid.*, Article 6.

797 *Ibid.*, Article 8(1).

798 *Ibid.*, Articles 8(1)(h), 15 and 18.

799 Law No. 146/2015, of 9 September it regulates activity of seafarers on board of vessels flying the Portuguese flag, available at <https://dre.pt/application/file/a/70236402>; amended by Law No. 29/2018 of 16 July, available at <https://dre.pt/application/file/a/115698801>.

result of the incorporation in our national legal system of the Maritime Labour Convention and as well dispositions from EU Directives. This legal instrument was prepared and designed entirely to consider the special conditions that seafarers face when on board a vessel. It seems more reasonable to keep this legal framework as it is and prepare a different legal instrument that regulates service that is provided by distance-based crew. It is necessary to approve a national legal regime that defines the legal framework for distance-based masters and crew. Criteria for the application of Portuguese law needs to be established. Portuguese law may be applicable to distance-based masters that are in charge of Portuguese flagged unmanned vessels but also to those who control foreign flagged unmanned vessels but are based in Portugal. Once the rules for Portuguese jurisdiction to apply are defined, it is also important to clarify the labour conditions for the exercise of the post.

- **Decree-Law 431/86, of 30 December, which regulates maritime towing contract**⁸⁰⁰ - it establishes specific formal requirements for the contract to be valid as well as rules for the execution of the contract itself. This legal regime can be applicable to unmanned vessels. Not only does this Decree-Law establishes no restrictions regarding the manning of the vessels involved in the contract but it also includes on its scope any other 'device' (*engenho*). Article 8 refers to 'proper crewing', however, without giving guidelines on the meaning of such concept. Decree-Law No. 265/72, of 31 July⁸⁰¹ imposes on Article 232 that the license to be given to tugboats to operate shall have a list of the crew involved. The license can include distance-based crew, but rules determining the safety of these operations and the number of crew involved as well as their duties and obligations shall be subject to proper legislation.
- **Decree-Law No. 355/93, of 9 October, which regulates the safe manning requirements for the safety of national vessels**⁸⁰² - this is one of the examples of a legal framework that do not need to be amended to apply to unmanned vessels. For instance, Article 2(3) determines that, in principle, ships are not allowed to leave for the sea without having on board the necessary crew members for the safe manning of the ship. Non-compliance with this provision is subject to civil liability not only by the owner of the vessel but

800 Decree-Law No. 431/86, of 30 December (n 413).

801 Decree-Law No. 265/72, of 31 July (n 392).

802 Decree-Law No. 355/93, of 9 October regulates the safe manning requirements for the safety of national vessels, available at <https://dre.pt/application/file/a/669900>.

also by the captain, as recognized by the decision of the Lisbon Court of Appeal.⁸⁰³ This article, as well as other provisions can be immediately applicable to unmanned vessels, provided that specific regulations that define technical requirements for remotely safe manning are in place. Alternatively, if due to technical features of unmanned vessels, it does not make sense to apply this regime to these crafts, new legislation shall be passed that defines safe requirements for distance-based masters and crew for unmanned vessels.

1.3 Amendments to the liability regime

The legal regime that regulates liability for damages caused to persons or things and caused to the marine environment by unmanned vessels is very complex.

- Rules regarding payment of compensation in case of collision are regulated in the Commercial Code and may suffice. However, in order to assess the fault of certain unmanned vessels in a concrete case of maritime collision, it is necessary that guidelines for their operations are in place. In order for the fault of a certain unmanned vessels in a collision to be determined, minimum norms of conduct shall exist. Otherwise, to prove that a certain unmanned vessel shall be liable would be complicated.
- In principle, in the liability regime, those who suffered damages are those who are required to prove, before the court, that the requirements for the damage to be compensated are fulfilled, unless the reverse of the burden of proof exists. It can be argued that the '*activity of command*' and '*control of a distance-based unmanned vessel*' are, by their nature or by the means employed, a dangerous activity and are likely to cause more damages than other general activities, as provided for in Article 493(2) of the CC. The concrete application of this Article to a situation involving unmanned vessels is not straightforward.

1.4 Amendments to the insurance regime

The insurance regime that applies to unmanned vessels is mainly regulated in the Commercial Code, which does not cover perils that may be exclusively related to the operations of unmanned vessels. The gap also exists regarding the operation of UMVs. Amendments to the Commercial Code or an adoption of a new legal framework is

⁸⁰³ Decision of the Lisbon Court of Appeal, *Summary*, (18/03/2003), available at http://www.pgdlisboa.pt/jurel/jur_mostra_doc.php?nid=1790&codarea=58.

necessary. Technical discussions are required in order to complete the following perils, which have already been identified as relevant for new legal regime to consider:

- Technological perils – this includes information leaking, software failures, cyber-attack, as well as any other technological problem that may interfere, corrupt or break with either the remote control that the shored-based operator is in charge of or involuntary changes to the pre-programmed route;
- Technical and mechanical malfunctions – this includes any technical problem that the unmanned vessel may suffer that interferes with the voyage and requires immediate human intervention;
- Electrical fire or any other problem with the vessel itself that affects the navigational system or the communications network;
- Collision perils – it is possible that the perils of collision can be avoided with the aid of technology, but this is still a risk that will require coverage.

1.5 Amendments to the MSR legal regime

The legal regime that regulates MSR essentially reproduces the UNCLOS dispositions without giving details on certain aspects that require further regulations by the States, as follows:

- Decree-Law No. 52/85, of 1 March,⁸⁰⁴ which lays down provisions for the exercise of activities in the national EEZ and also regulates MSR. This legal instrument shall be amended in order to clarify what constitutes an appropriate method of research. Particularly when it comes to the use of UMs in MSR projects, the legislation should require that some information regarding their use shall be provided along with the proposal, such as:
 - The type of UMV involved, including reference to its dimension, colour, format, propulsion, endurance, and technology employed for operation;
 - The ownership of the UMV;

804 Decree-Law No. 52/85, of 1 March (n 512).

- Explanation as to how UMV will operate and collect the necessary information, so it can be clear, for instance, that U MVs will not be used for applied MSR projects and for collecting information on natural resources;
 - Signaling and safety measures to be observed for the safety of navigation and protection of the marine environment.
- Article 20(1) of Decree-Law No. 52/85, of 1 March determines that conditions for the exercise of MSR in the territorial sea shall be defined in appropriate legislation, which has not been passed yet. It is recommended that regulations are approved that define legal conditions for MSR to be carried out in the territorial sea;
 - The Autonomous Region of Madeira is entitled to regulate procedures to authorize MSR in waters adjacent to the Region, but as up to now, no regional regulations have been approved. It is recommended that regulations are passed so MSR projects carried out in waters adjacent to the Region can be authorized or rejected in accordance with the provisions of the regulations in place;
 - Applied MSR in the fisheries sector is poorly regulated in Regulation (*Decreto Regulamentar*) No. 16/2015, of 16 September.⁸⁰⁵ The Ministerial Dispatches complementing the Regulation do not provide any details on the requirement of applications to conduct applied MSR in the sector. It is recommended that a new provision is introduced in Regulation No. 16/2015, of 16 September that imposes on the applicant the submission of information on the nature, duration, and objectives of the project, as well as on the methods used;
 - Applied MSR in the geological sector is regulated in Law No. 54/2015, of 22 July.⁸⁰⁶ However, legal procedures to be observed by applicants that are keen to proceed to the exploration phase are still to be legislated for. It is recommended that in future legislation, a disposition is placed that requires information on the methods to be use in the exploration.

805 Regulation (*Decreto Regulamentar*) No. 16/2015, of 16 September (n 405).

806 Law No. 54/2015, of 22 July (n 589).

2. Creation of a legal regime for UUVs

UUVs may be employed for different purposes and may be used by both public and private entities. As it was the case with aerial drones, it is recommended that general legislation is passed that regulate activities of UUVs in waters under Portuguese sovereignty or jurisdiction. Technical discussions are necessary for the legislation to be produced. Meanwhile, some ideas may be out forward:

- **Creation of a registration of UUVs ownership** - security and safety concerns, as well as liability and salvage purposes justify the creation of a legal regime that establishes a national data base for UUVs to be registered. It is recommended that the registration is processed electronically by the owner or the operator of the UUV or by someone on her or his behalf. UUVs may be registered by the operator, who shall be understood in a broad way, as it is the case with the definition given for the operators of aerial drones.⁸⁰⁷ When the owner or the operator is not a natural or legal person, which may occur with laboratories, the registration shall be done by the entity in charge of the laboratory. For registration to be made, information on the main features of the UUV as well as its area of navigation shall be provided. Exception to registration may be justified at the domestic level for UUVs that are being developed and are still in a testing or experimental phase by research institutions. MSR projects that are aimed at developing different types of UUVs may be excluded from registration since the UUV is being constructed. Nevertheless, from the moment they are built and are going to operate in the marine environment, registration shall be mandatory. Military UUVs, and UUVs owned or operated by the State for non-commercial purposes shall also be exempt from registration.
- **Signaling** - while there are no internationally agreed rules for UUVs' signaling, the Portuguese legal system may adopt interim measures to facilitate the identification of UUVs navigating in waters under Portuguese sovereignty and jurisdiction, *maxime*, in the territorial sea.
- **Liability regime** - considering the similarities that UUVs have with aerial drones, it is recommended that the legislation to be prepared shall impose a strict liability regime for UUVs operators as well as mandatory insurance that is aimed at covering any damage caused by UUVs used in any activity.

807 Decree-Law No. 58/2018, of 23 July (n 606), Article 2(f).

- **Evidence**- since UUVs may be used by law enforcement agents for collecting evidence of maritime offences and even maritime crimes, it may be relevant that the new legislation introduces a special regime that clearly recognizes the possibility of evidence collected by UUVs to be used in different court procedures. As it has been explained, the current legal regime in force may accommodate, under certain circumstances, the use of evidence collected by UUVs. Yet, the creation of a clear framework that admits the possibility of UUVs and even aerial drones to provide evidence to courts, may avoid situations of unnecessary delays and uncertainties during the court procedures.

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