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Mr. Stuart Hetherington
President of the CMI.-
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CC: Tom Birch Reynardson

CMI IWG Questionnaire on "Unmanned Ships" — AEDM Response

Dear Mr. President,

I refer to your letter of 29 March 2017, addressed to the Presidents of all national Maritime Law Associations. Please, find enclosed the response of the Spanish Maritime Law Association (AEDM) to the CMI IWG Questionnaire on "Unmanned Ships" of 29 March 2017.

The answers to this CMI Questionnaire have been prepared by an internal AEDM Working Group on "Unmanned Craft" formed by Beatriz Huarte (Chair); Gonzalo Alvar; José Manuel González; Verónica Meana; Ángel Vallejo; and Celia Lopera. Final work was revised by the EXCO of the SMLA.

With kind regards,

EDUARDO ALBORS

President of the Spanish Maritime Law Association



CMI QUESTIONNAIRE ON UNMANNED SHIPS

INTRODUCTION

Unmanned ships are those which are capable of controlled movement on the water in the absence of any onboard crew. Control is performed in essentially two ways. It can be performed by remote-control, whereby a shore-based remote controller uses a computer and joystick to control the unmanned ship's movement and signalling using radio and satellite communications. In doing so the controller is aided by the streaming of the ship's vicinity effected by cameras and aural sensors affixed to the ship's hull / chassis. There is a small delay in the transmission of information to and from the ship, like with all forms of satellite communication. On the other hand, the ship may be "controlled" autonomously. This involves the ship being pre-programmed before deployment, and, thereafter, performs a predetermined nautical course without any human interaction. This control, as well as a degree of collision avoidance capability, is affected with the use of highly sophisticated software technology, control algorithms and sonar radar.

Whereas unmanned ships in operation today are small in size (<20m in length) and essentially used for marine scientific research and military purposes their number has risen exponentially in recent years and so has the number of research projects aimed at developing the first unmanned merchant ships of 500 grt or more.

In order to ensure that the required regulations are in place once these ships become a technical reality, CMI Executive Council has set up an International Working Group (IWG) to study the current international legal framework and consider what amendments and/or adaptations and/or clarifications may be required in relation to unmanned ships.

In answering the questions below please assume that they are made in relation to an unmanned ship of 500 grt or more.

1. National law

1.1. Would a "cargo ship" in excess of 500 grt, without a master or crew onboard, which is either

1.1.1. Controlled remotely by radio communication?

1.1.2. Controlled autonomously by, inter alia, a computerised collision avoidance system, without any human supervision constitute a "ship" under your national merchant shipping law?

The Spanish Maritime Navigation Act (14/2014) (hereinafter the "MNA") does not specifically regulate the so called "unmanned ships", neither those falling under item 1.1.1. above nor under 1.1.2. above.

The concept of "unmanned ships" has no totally comfortable fitting within the concept of "navigation vehicles" ("vehículos de la navegación") defined in the MNA. The MNA specifically

refers to four types of navigation vehicles: 1) ship ("buque"), 2) vessel ("embarcación"), 3) naval artefact ("artefacto naval") and 4) fixed platform ("plataforma fija").

The ship is defined (art. 56 MNA) as any vehicle with structure and capacity to navigate the sea and to transport people or things, with a running deck and a length equal to or greater than twenty-four metres. The vessel (see art. 57 MNA) differs from the ship in which has no running deck or has a length of less than 24 metres, excluding those qualified as minor units as per relevant regulations in accordance with its propulsion or utilisation characteristics. The naval artefact (art. 58 MNA) is defined as every floating construction with capacity and structure to house people or things, whose destination is not navigation, but to be located in a fixed point of the waters, even if it has the capacity to navigate. The fixed platform is considered by the MNA as an immovable asset (*i.e.*, it would never fall under the category of a "moving" object).

In our opinion, any of the so called "unmanned ships" (as per 1.1. herein) which fulfil the features required by the MNA to be qualified as a ship (independently of being remotely or autonomously controlled) would be considered as a ship as per Spanish merchant shipping law (see however our response to questions 1.2. regarding registration and 1.4. and 1.5. regarding limitations and impossibility to operate such "unmanned ships").

It would be however desirable that specific regulation(s) are passed in order to affirm the absolutely necessary legal certainty regarding this issue.

1.2. Would an unmanned "ship" face difficulty under your national law in registering as such on account of its unmanned orientation?

Yes, it would. Under Spanish law it would face several difficulties (if not impossibility) to be registered.

Thus, even if an "unmanned ship" is considered as a ship under the MNA, several regulations (including the MNA), such as the Royal Decree 1027/1989 of 28 July on Flagging Out and Ship Registration, which develops the regulation of registration and flagging in Spain and the Royal Legislative Decree 2/2011, of September 5, by which the Revised Text of the Law on State Ports and the Merchant Marine is approved (hereinafter the "Spanish Ports Act"), as well as other regulations - either of internal origin or issued by international authorities like the International Maritime Organization (IMO), as applicable in Spain - seem to require a "Minimum Safe Manning/crew" **on board** of any merchant ship.

In such sense, it is to be remarked that in accordance to the aforementioned Spanish Ports Act, registration of a ship in the Canary Islands Special Registry (REBECA) requires previous authorisation by the Spanish maritime authorities of the minimum crew of such a ship while, in relation, the MNA strictly defines the concept of crew ("dotación") as –among other features- "*persons working on board*".

In any event, we insist that it is desirable that specific regulation of the legal regime applicable to "unmanned ships" is adopted in Spain (either by direct issuance of the corresponding Spanish authorities or by adopting any international regulation approved within the IMO and/or the European Union).

1.3. Under your national law, is there a mechanism through which, e.g., a Government Secretary may declare a “structure” to be a “ship” when otherwise it would not constitute such under the ordinary rules?

No, there is not. Governmental authorities are subject to the specific terms of the MNA and related regulations, which do not foresee such a possibility.

A different issue is that, in practical terms, there may be some room as whether the maritime authorities can interpret that a specific “unmanned ship” falls (from a technical point of view) within the so mentioned categories regulated under the MNA.

1.4. Under your national merchant shipping law, could either of the following constitute the unmanned ship’s “master”

1.4.1. The chief on-shore remote-controller

1.4.2. The chief pre-programmer of an autonomous ship

1.4.3. Another ‘designated’ person who is responsible on paper, but is not immediately involved with the operation of the ship

1.5. Could other remote-controllers constitute the “crew” for the purposes of your national merchant shipping laws?

Spanish law seems to require that “merchant ships” are physically manned, i.e., the crew members have to be on board (at least a Minimum Safe Manning/crew is required, as mentioned in 1.2. above). As a consequence, we understand that none of the persons mentioned in items 1.4.1., 1.4.2, 1.4.3 and/or 1.4.3. can be considered as master and/or crew for purposes of Spanish merchant shipping law.

In our opinion, even if a so called “unmanned ship” might be registered and recognized as a ship in Spain, the operator of such a ship would face enormous difficulties (if not the impossibility) to operate here where and when Spanish law applies.

2. United Nations Convention on the Law of the Sea, 1982 (UNCLOS)

2.1. Do you foresee any problems in treating unmanned ships as “vessels” or “ships” under the Law of the Sea in your jurisdiction (i.e. that such ships would be subject to the same rights and duties such as freedom of navigation, rights of passage, rights of coastal and port states to intervene and duties of flag states) in the same way as corresponding manned ships are treated?

The terms “ships” or “vessels” are not defined by UNCLOS and they are used interchangeably in this Convention. In this regard, UNCLOS Article 91 provides that each State shall fix the conditions for the grant of its nationality to ships, which means that the national law of the flag state is essential for the definitions used:

“Article 91 (nationality of ships):

1. Every State shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the

nationality of the State whose flag they are entitled to fly. There must exist a genuine link between the State and the ship.

2. Every State shall issue to ships to which it has granted the right to fly its flag documents to that effect."

Hence, to study whether the concept of ship or vessel in UNCLOS can be applied to the unmanned fleet in accordance with Spanish legislation, it is necessary to examine, first of all, the MNA to observe the definitions that it provides. Accordingly, as explained above in chapter 1.1, the MNA makes a distinction between both concepts:

- *"Article 56 (ship): A ship is defined as any vehicle with the structure and capacity to sail on the sea to transport individuals or things, which has a full deck and a length equal to or greater than twenty- four metres."*
- *"Article 57 (vessel): A vessel is defined as any vehicle that lacks a full deck and has a length under twenty- four metres, as long as, in one case and another, it is not classified by the implementing regulations as a minor unit according to its characteristics of propulsion or use."*

In principle, considering the "ship" and "vessel" definitions under the MNA, it appears that it is not necessary for a ship (or a vessel) to be manned (to have crew on board). However, Articles 56 and 57 must be interpreted in the light of other legal provisions. Thus, pursuant to Article 161.2 of the mentioned MNA: "The Maritime Authorities shall establish a minimum safety crew for each Spanish ship according to its technical circumstances, navigation and traffic, as well as the regime and organisation of work on board." In addition, Article 161.3 thereof reads as follows: "The Maritime Authorities shall issue a "Minimum Safety Crew Certificate" that shall be carried on board and shown to the authorities of the port the ship visits and when so required."

Furthermore, the Spanish Ports Act, similar to the MNA, refers to the provision on "crew of the ships on board" in Article 253, whose first paragraph establishes that "the number of crew members of the ships and their conditions of professional training must be adequate to guarantee the safety of the navigation and the ship at all times, taking into account their technical and operational characteristics, under the terms established by regulations."

Consequently, pursuant to Spanish legislation, it is necessary for a ship to be manned (to have crew on board) for safety reasons. In relation to this, it is not clear whether manned ships and unmanned ships do similar tasks and involve similar dangers; for that reason, it should be, first of all, clarified whether unmanned ships might be subject to the same rules than the rules designed to address those tasks and dangers by which manned ships are involved. Hence, according to Spanish Law, it could be problematic to treat unmanned ships or unmanned vessels under the Law of the Sea in the same way as manned ships are treated.

Nevertheless, it should be reminded that at the time Spanish legislation on Maritime Law as well as UNCLOS were drafted, the current technological developments were not foreseeable. Accordingly, due to the particularities of unmanned ships, which may be either supervised or unsupervised by a shore-based remote controller, it is important to adapt the Convention (as well as national legislation) to unmanned fleet.

2.2. Paragraphs (3) and (4) of UNCLOS Article 94 include a number of obligations on flag states with respect to the manning of such ships. Do you think that it is possible to resolve potential inconsistencies between these provisions and the operation of unmanned ships without a crew on board through measures at IMO (under paragraph (5) of the same Article) or do you think other measures are necessary to ensure consistency with UNCLOS? If so, what measures?

Flag state jurisdiction is the basis of the regulatory authority over ships. In this regard, on the one hand, UNCLOS establishes in Articles 90 and 91, respectively, that all States have a right to sail ships flying their flag and to fix the conditions for granting nationality to ships; and, on the other hand, the Convention also establishes detailed duties for flag states in Article 94.

Paragraphs 3, 4 and 5 of UNCLOS Article 94 (duties of the flag State) read as follows:

"3. Every State shall take such measures for ships flying its flag as are necessary to ensure safety at sea with regard, inter alia, to:

- (a) the construction, equipment and seaworthiness of ships;*
- (b) the manning of ships, labour conditions and the training of crews, taking into account the applicable international instruments;*
- (c) the use of signals, the maintenance of communications and the prevention of collisions.*

4. Such measures shall include those necessary to ensure:

- (a) that each ship, before registration and thereafter at appropriate intervals, is surveyed by a qualified surveyor of ships, and has on board such charts, nautical publications and navigational equipment and instruments as are appropriate for the safe navigation of the ship;*
- (b) 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;*
- (c) 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.*

5. In taking the measures called for in paragraphs 3 and 4 each State is required to conform to generally accepted international regulations, procedures and practices and to take any steps which may be necessary to secure their observance."

As it can be observed from these three paragraphs of UNCLOS Article 94, the Convention establishes general obligations to avoid conflicts with the development of international law and national legislations. On the contrary, the more precise extent of flag states' obligations is left to be developed by the International Maritime Organization (IMO).

Consequently, in case that unmanned ships would be considered as "ships" under international law, it should be possible to resolve potential conflicts with Art. 94 (3) and (4) of UNCLOS by way of IMO measures under Art. 94 (5). This is a non-exhaustive list:

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- Development of standards for software and hardware used to operate unmanned ships.
- Development of standards for the choice of neutralization techniques in case of threat.
- Development of protection systems to prevent attacks on unmanned ships (Counter-USV: Unmanned Surface Vehicle).
- Development of standards for the qualifications and training of the shore-based personnel involved.
- Developing standards for documentation and data processing.
- Adapting ISM requirements to unmanned shipping.
- Development of rescue measures for unmanned ships in case of failure that ensure the control of the flag state.
- Development of unmanned ships' location systems in case of sinking (similar to the aircraft black box system).
- Liability.
- Harmonization of the use of the radioelectric spectrum at an international level to improve and speed up communications among unmanned craft.

However, due to the current lack of legislation, unmanned ships are considered threats only when they have the potential to perform illegal, dangerous or malicious activities. This includes scheduled or controlled devices to carry out a hostile mission, operated by an unprepared or negligent individual, flying over unauthorized areas or breaking existing air legislation. Hence, it is important to establish a system for the detection, classification, monitoring and neutralization of unmanned ships to combat dangerous situations or undesired threats through the development of detection, classification and monitoring technologies (e.g., radars, acoustic-based sensors, passive visible images, passive thermal imaging, radiofrequency emissions, etc.).

The choice of neutralization techniques (effectors) is an important task that must be regulated, because there are three aspects that must be considered to make this choice. In the first place, most of the effectors produce collateral damages that must be known and valued for the operating scenario that arises, such as interference, denial of services or even physical damage. Secondly, the range of interception or influence of the effector is also an important aspect, it must be greater than the area to be protected. And, thirdly, choosing the effector is not independent of the detection, classification and tracking sensors, since some effectors can dictate requirements on previous stages (such as target location, operating frequency, distance, etc.).

In conclusion, it is necessary to adapt international legislation to the development of new technologies, such as unmanned ships, to ensure legal certainty.

3. IMO Conventions – The International Convention for the Safety of Life at Sea (SOLAS) 1974 (as amended)

3.1. Does your national law implementing the safe manning requirement in Regulation 14 of Chapter V of SOLAS require at least a small number of on board personnel or does the relevant authority have the discretion to allow unmanned operation if satisfied as to its safety?

The manning of seagoing vessels under Spanish flag is governed by the following regulations and legal provisions, some of which have been already mentioned in chapter 2.1:

- Article 253, and Additional Provision nº 16, 6 b, of the Spanish Ports Act, according to which the Spanish Ministry of Development (Ministerio de Fomento) has to issue a Minimum Safe Manning Certificate including a minimum number of qualified crew members for each vessel (before her registration), specially taking into consideration the vessel's particular "level of automation" and the need to ensure a safe navigation.
- Article 161 of the MNA, according to which "the number of members of the crew of ships and their conditions of skills and professional training shall be adequate to guarantee the safety of the ship and navigation at all times, as well as to protect the marine environment". The Maritime Authorities shall establish a minimum safety crew for each Spanish ship according to its technical circumstances, navigation and traffic, as well as the regime and organisation of work on board. Again, the Maritime Authorities (Ministry of Development) shall issue a "Minimum Safety Crew Certificate" that shall be carried on board and shown to the authorities of the port the ship visits and when so required.
- The 1964 Ministerial Decree on Minimum Crew for Merchant and Fishing Vessels.
- The Royal decree 1561/1995 on Special Working Times.
- The IMO Resolution 890(21), dated on 25th November 1999, concerning the Principles of Safe Manning.

According to the above rules it is indeed required to have a minimum safe manning onboard the vessel; such safe manning is discretionarily decided by the Ministry taking into account several parameters, such as the vessel's type, traffic and level of automation. It is for the Ministry (through the Maritime Authorities) to accept, reject or modify the owner's minimum safe crew proposal.

In the light of the above rules there is no doubt that the vessel must be manned at all times. No individuals located ashore can operate the ship on a remote-control basis. Although the rising of the vessels' level of automation has reduced the crew members on board, a specific legal reform should be needed to allow for the operation of unmanned vessels.

Therefore, the relevant current Spanish regulations expressly forbid the possibility of an unmanned vessel.

3.2. Regulation 15 of SOLAS Chapter V concerns principles relating to bridge design. It requires decisions on bridge design to be taken with the aim of, inter alia, “facilitating the tasks to be performed by the bridge team and the pilot in making full appraisal of the situation...”. In the contest of a remote controlled unmanned ship, could this requirement be satisfied by an equivalent shore-based facility with a visual and aural stream of the ship’s vicinity?

Pursuant to MNA Article 182, among the so called "technical obligations of the master" the latter is bound to (a) provide the technical direction for navigation of the ship, (c) undertaking its effective command when he sees fit and, in particular, (d) has to be present on the bridge and undertake direct command of the ship during landings, port arrival and departure manoeuvres and, in general, in all circumstances in which the risks of navigation are notably increased, without prejudice to the necessary rest to maintain his physical faculties.

Therefore, a remote-control vessel is, in principle, not acceptable in the light of the said rule. We understand that the latter may be amended if the technology is eventually capable of allowing the Masters to effectively and safely pilot the vessel on a remote-control basis with all the proper safeguards.

3.3. As interpreted under national law, could an unmanned ship, failing to proceed with all speed to the assistance of persons in distress at sea as required by Regulation 33 of SOLAS Chapter V, successfully invoke the lack of an on-board crew as the reason for omitting to do so (provided that the ship undertook other measures such as relaying distress signals etc.)?

No, it could not. The duty to assist persons in distress also applies to unmanned ships, although the kind of material assistance that may be provided shall be clearly compromised by the fact that the vessel is not crewed. The designers of the unmanned vessels shall have to bear in mind that the assistance of persons in distress at sea is a sacred rule that need to be complied with at all times and when feasible without endangering the safety of the assisting vessel.

4. The International Regulations for Preventing of Collisions at Sea, 1972 (COLREGS)

4.1. Would the operation of an unmanned “ship” without any on board personnel, per se, be contrary to the duty / principle of “good seamanship” under the COLREGS, as interpreted nationally, regardless of the safety credentials of the remote-control system?

In order to give an answer to the question of whether the operation of an unmanned “ship”, without any on board personnel, be contrary to the duty of “good seamanship”, it is necessary to analyse the judgments that refer to such duty.

Spanish courts have not given an explicit and unified definition of what they consider “good seamanship” under COLREGS. For example, the Court of Appeals of Barcelona (section 15) in the judgement number 512/2004 dated 26th November 2004, where the Court had to examine the conduct of the crew as a result of the loss of various containers due to bad weather, applied general tort principles to conclude that liability of the carrier required the

examination of the conduct (of the Master) and whether it complied with the standard of due care of a professional mariner. This judgement, however, does not specify what should be the standard of care of a professional mariner. Other Courts, such as the Spanish Supreme Court (Criminal Docket – Section 1) in its judgement dated 7th December 1984, in a collision matter, have considered that “good seamanship” requires observing the standard of care that the circumstances require according to the Regulations for preventing collisions at sea.

The idea that “good seamanship” requires the compliance with the COLREGS appears many times in Spanish case law. For instance, in a judgement dated 24th October 2010 handed by the Court of Appeals of A Coruña (Section 4) in a matter of a collision of a fishing vessel (“Atlantic A”) with a yacht that was at anchor. This judgment established that the cause of the collision had been the “omission” of the fishing vessel’s crew of the duty of the rules and standard of care established by the COLREGS and, accordingly, awarded liability to the fishing vessel. A similar judgment would be the one handed by the Court of Appeals of Las Palmas (Section 4) number 455/2012 dated 5th November 2012 (in the collision between vessels “Macarena B” and “Astra”), by the Court of Appeals of Lugo (Section 1) number 229/2016 dated 31st May (in the collision between vessels “Martin Albizu Anaiak” and “Espadin Dous”) or by the Court of Appeals of Pontevedra (Section 4) dated 18th March 2002 (in the collision between “Pescarosa Segundo” and “Iriarte”).

Nevertheless, the standard of care required is not limited to following to the letter the rules established by COLREGS for the prevention of a collision. It requires something further, as Rule 2 of COLREG establishes. This has been recognized by some Spanish Courts such as the Court of Appeals of Las Palmas (Section 4) in its judgment number 346/2005 dated 8th May 2005, again in a collision matter between vessels “Leonid Galchenko” and “Miya”. The Court in such judgment established that COLREGS, in Rule 2, requires more than just following the specific Rules for preventing collisions that the COLREG sets forth and stated that sometimes “good seamanship” means departing from those Rules when special circumstances, including the limitations of the vessels involved, the risk of collision, or the dangers to navigation, dictate that it is necessary to depart from them and to take any precaution that a reasonable mariner would take. Therefore, “good seamanship” is not seen as the habitual practice of a mariner but what a reasonable mariner would do in order to avoid the risk of collision.

Having noted the above, it is possible that the operation of an unmanned ship would be currently held as contrary to the principle of “good seamanship” as in most judgements such principle requires to follow the Rules of COLREGs, which only have in mind manned vessels. It is worth noting in this sense judgment number 368/2008 issued by the Tribunal Superior de Justicia of Madrid (Administrative Docket) dated 29th February 2008 in the proceedings filed by a company against the decision of the General Directorate of the Merchant Navy to impose a fine for breach of marine regulations. The sanctions issued by the Directorate followed a breach of the crew members of their duty to answer the VHF Channel 16 calls that were made to the vessel and the lack of compliance with COLREG. It expired in the investigation of the matter that the crew members on duty had abandoned the bridge to go for lunch and the Court, affirming the sanction of the Directorate, held that COLREG established the duty to carry out a proper look out (by sight and hearing) which could not be complied with if the crew members were not at the bridge. Therefore, it would be advisable a change in the COLREGS to clarify whether good seamanship may also be affected “remotely” and whether the standard of care required to run a vessel may be satisfied from a shore based facility.

4.2. Would the *autonomous* operation of a “ship”, without any on-board personnel or any human supervision, be contrary to the duty / principle of “good seamanship”, under the COLREGS, as interpreted nationally, regardless of the safety credentials of the autonomous control system?

Unless COLREGS is amended, and following the case law quoted above, it is likely that an autonomously operated ship without any on-board personnel or any human supervision be contrary to the principle of good seamanship. It would be also necessary for COLREGS to establish what safety credentials would satisfy the standard of care required to comply with the principle of good seamanship. If changes are made to COLREGS, Spanish courts would take into consideration the amendments when interpreting what is required to be a reasonable and prudent seaman/vessel operator/safety system of an autonomous ship.

4.3. As interpreted under national law, could the COLREGS Rule 5 requirement to maintain a “proper lookout” be satisfied by camera and aural censoring equipment fixed to the ship transmitting the ship’s vicinity to those “navigating” the ship from the shore?

Rule 5 establishes that a proper look out should be held “by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions...”. Spanish case law, in case of manned ships, has established that a proper look out should be held from the bridge of the vessel (see reply to question 1.1 above) and that good seamanship requires presence on board the vessel. But again, this case law did not have in mind the possibility of unmanned vessels. It is possible that when dealing with unmanned vessels, Spanish courts will hold that camera and aural censoring equipment, transmitting the information simultaneously to a remote-control operator, satisfies the “by sight and hearing” lookout. However, given that Rule 5 establishes the need to use, in addition to visual and hearing look out, “all available means appropriate in the prevailing circumstances and conditions”, it is possible that the courts will consider included in those “available means” not only radars or electronic charts but also the use of sensors and cameras and that, as it is actually written, visual and hearing look out should be also maintained from within the ship. It would be advisable a change in the COLREGS to deal with the possibility of remote controlled ships and the uncertainty that it would imply in the interpretation of COLREGS.

4.4. Would a ship navigating without an on-board crew constitute a “vessel not under command” for the purposes of COLREG Rule 3(f), read together with COLREG Rule 18, as interpreted under your national law?

According to Rule 3 (f) of COLREGS, the term “vessel not under command” means a vessel unable to manoeuvre as required and is unable to keep out of the way of another vessel. Spanish courts have considered that stopping by choice does not make the ship “not under command” and does not award the ship in question any privilege or preference. We refer, for example, to judgment number 13/2014 issued by the Audiencia Nacional (Criminal Docket, Section 4) on 3rd April 2014 following the collision of fishing vessels “Peixmar Treinta” and “Rio Huelva Uno”. This criminal Court decided that from the evidence available, there was no evidence that the “Peixmar Treinta” had an engine breakdown or that there was a situation of actual danger, therefore, “Peixemar Treinta” did not qualify as a “vessel not under command”. Another example is judgement number 243/2007 dated 21st May 2007 of the Court of Appeals

of A Coruña (Section 4), in the collision of the fishing vessels "Playa de Bares" against "Nuevo Flechero", which defined "vessel not under command" in similar terms.

Based on this reasoning, a ship operating without a crew on board, would not qualify as a "vessel not under command" as it has the capacity to manoeuvre either if this is by remote control or pre-programmed.

5. The International Convention on Standards of Training Certification and Watchkeeping, 1978 (STCW Convention)

5.1. The STCW Convention purports to apply to "seafarers serving on board seagoing ships". Would it therefore find no application to a remotely controlled unmanned ship?

No, it would not. Since Article III of the Convention provides that it shall be only applicable to seafarers serving on board seagoing ships, unmanned ships would not fit in such a wording.

5.2. As interpreted under national law, can the STCW requirement that the watchkeeping officers are physically present on the bridge and engine room control room according to Part 4 of Section A-VIII/2 be satisfied where the ship is remotely controlled?

In our opinion, such a requirement would not be satisfied in a ship remotely controlled since as far as we understand it, there would not be anybody physically on board. Therefore, an amendment on the STCW would be necessary to make that such a requirement is somehow applicable in a ship remotely controlled.

Is the situation different with respect to ships with a significantly reduced manning (bearing in mind that the scope of the convention only applies to seafarers on board seagoing ships)?

Yes, it could be different, always provided that such a reduced crew fulfil with the minimum requirements provided not only in the STCW Convention but also in the Maritime Labour Convention 2006 and in the MNA. In any case, an amendment in the STWC should be very likely required to be applicable in unmanned ships.

6. Liability

6.1. Suppose a “ship” was navigating autonomously i.e. through an entirely computerised navigation / collision avoidance system and the system malfunctions and this malfunction is the sole cause of collision damage – broadly, how might liability be apportioned between shipowner and the manufacturers of the autonomous system under your national law?

In Spain collision liability is ruled by the 1910 Collision Convention and by the MNA. These regulations set out the liability regime for damages caused to third parties (liability in tort) and do not affect liabilities under contract (i.e., carriage of cargo onboard, or contract with crewmembers or passengers on board).

Liability in tort is generally ruled by Article 1902 of the Spanish Civil Code, which reads as follows:

Chapter 2: On obligations arising from fault or negligence

Article 1902: The person who, as a result of an action or omission, causes damage to another by his fault or negligence shall be obliged to repair the damaged caused.

We can then say that the system of collision liability set out in the 1910 Collision Convention and the MNA, both based on proved fault, is coincident with that one generally applying in Spain.

It is important to say that the Spanish Civil Code provides for a vicarious liability. A company will be held responsible for the acts or omissions caused by fault of its employees, and sometimes by its subcontractors when the company had the obligation to supervise them (the so-called responsibility “in eligendo” and “in vigilando”):

Article 1903: The obligation imposed pursuant to the preceding article shall be enforceable not only as a result of one’s own actions or omissions but also of those of such persons for whom one is liable.

Parents are liable for damages caused by children under their care.

Guardians are liable for damages caused by minors or incapacitated persons who are under their authority and who live in their company.

Likewise, the owners or managers of an establishment or undertaking shall be liable for damages caused by their employees, in the service in which they are employed or in the performance of their duties.

Persons or entities which own an educational centre other than a centre for higher education shall be liable for the damages caused by its underage students during the periods in which the latter are under the control or supervision of the Centre’s teaching staff, or while conducting school, extracurricular or complementary activities.

The liability provided in the present article shall cease if the persons mentioned therein should evidence that they acted with all the diligence of an orderly paterfamilias to prevent the damage.

Under Spanish law, a shipowner will not be held responsible if the collision is due to an Act of God or Force Majeure. Similarly, there would be no liability if the cause of the collision is left in doubt.

In the example subject of study (collision exclusively due to system malfunction) a Spanish court would focus on the facts leading to the malfunction so as to evaluate if it could be regarded as a force majeure situation: Could the malfunction have been reasonably expected by the shipowner? Was it completely unavoidable? If it proved that the shipowner did not contribute to the system malfunction at any extent, he would not be responsible for the collision damages at all.

The manufacturer could be found responsible for the damages in an action in tort, in accordance with article 1902 of the Spanish Civil Code quoted above. The claimant would bear the burden to prove the manufacturer's fault and, in addition, that his act or omission was causative for the collision. Again, the manufacturer would be responsible for the acts of its servants and employees.

The manufacturer liability may also be claimed under the product liability regime. Under Spanish law consumer protection is set out in the Royal Legislative Decree 1/2007 approving the revised text of the General Law for the Protection of consumers and Users and other Supplementary Laws. Book III of such an Act rules on Civil liability for defective goods or services implementing the EU Directive 85/374 and providing as follows:

Article 129 (scope of protection): The liability regime set for in this book includes personal injury including death, and damage to property provided that these might affect goods or services which are objectively intended for private use or consumption and have been utilized mainly as such by the injured party.

Such liability would not be excluded or reduced if a third party (i.e., the shipowner) did also contribute to the damage. The manufacturer could then seek recovery from such third party in apportion to its respective contribution to liability (art. 133 of the Royal Legislative Decree 1/2007).

6.2. Arts. 3 and 4 of the 1910 Collision Convention provide for liability in cases of fault. As interpreted under your national law, does the fact that the non-liability situations listed in Art. 2 are not conversely linked to no-fault, leave room for the introduction of a no-fault (i.e., strict) liability (for e.g., unmanned ships) at a national level?

The liability based in fault has been recently reconfirmed in Spain by the enactment of the MNA. The previous regime (Articles 827 and 828 of the Royal decree of 22/08/1885 publishing the Commercial Code) provided for a presumption of fault in cases where the cause of the collision was left in doubt. In that scenario, both vessels were presumed to be in fault and each shipowner had to bear its own damages.

The MNA, in consistency with the 1910 Collision Convention, provides that there is no presumption of fault at all. Fault has to be duly proved by the claimant (art. 340.2 of the MNA). Following this basic principle of liability based in fault, it was not deemed necessary to include in the MNA any corresponding provision to art. 2 of the 1910 Collision Liability Convention. In other words, there is no express reference in the MNA to accidental collisions, force majeure or unclear causes which would not attribute liability because it would have been redundant. In this regard, it is interesting to note that the draft of the current MNA as published in 2004 incorporated an Article 402 on accidental collisions or collisions whose causes were unknown. This article disappeared from the text which was approved in 2014.

Under the above circumstances it would be highly unlikely that Spanish legislator or a judge would use Article 2 of the 1910 Collision Liability Convention to apply a strict liability regime for unmanned vessels.

On a different perspective it should be noted that the Spanish legislator tends to establish strict liability regimes in risky activities such as air navigation, traffic vehicles, nuclear energy, hunting or producer responsibility to name only some. In such cases third party liability compulsory insurance is required. One cannot completely exclude that navigation of unmanned ships could be regarded as a risky activity and configured under a strict liability regime in Spanish domestic law if the 1910 Collision Convention did not apply (i.e., art. 12.2 of the Convention).

CONCLUSIONS

As it has been explained throughout the document, in accordance with Spanish law it is mandatory that ships are manned, mainly for safety reasons.

In this regard, it is still unclear whether manned ships and unmanned ships can perform the same tasks or whether they are subject to the same dangers. It is also not clear if it would be possible that, in case that the safety of unmanned ships (without any crew on board) were guaranteed, the number of persons that forms the crew of the ship could be zero (according to art. 253 of the Spanish Ports Act and MNA art. 161). This would also affect the Royal Decree 1027/1989 of 28 July on Flagging Out and Ship Registration.

Nevertheless, as it has been mentioned above, it should be reminded that at the time Spanish legislation on Maritime Law as well as International Maritime Law Conventions were drafted, the current technological developments were not foreseeable. Accordingly, due to the particularities of unmanned ships, which may be either supervised or unsupervised by a shore-based remote controller, it is important to adapt international law (as well as national legislations) to unmanned fleet.

In this point, it is noteworthy that, in case of the Law of the Air, according to the International Civil Aviation Organization (ICAO), "unmanned aircraft" is defined as "an aircraft which is intended to operate with no pilot on board" (ICAO CIR 328 AN/190) and, therefore, unmanned aerial vehicles (UAVs) are generally regulated by the national aviation Authorities of each country. In fact, at the European level, the European Aviation Safety Agency (EASA) is working on unmanned aircraft regulations and, at the national level, Spain regulates unmanned aircraft in the "Royal Decree-Law 8/2014, of July 4, 2014, on the approval of urgent measures for growth, competitiveness and efficiency", which will be amended by the end of 2017 (the new Royal Decree on drones has been approved on 15th December 2017).

That said, if the IMO integrates the concept of "unmanned ship" as a ship which is intended to operate with no crew on board (as the ICAO did, *mutatis mutandis*, with the concept of "unmanned aircraft"), then it would be necessary to study the possible amendment, change of interpretation and/or creation of new maritime legislation under Spanish Law.

In conclusion, it is necessary to adapt international legislation (as well as national legislations) to the development of new technologies, such as unmanned ships, to ensure legal certainty.