COMITE MARITIME INTERNATIONAL AMBERES BELGICA

ASOCIACION ARGENTINA DE DERECHO MARITIMO

ARGENTINE MARITIME LAW ASSOCIATION

RESPONSE TO THE CMI QUESTIONNAIRE ON UNMANNED SHIPS

Preliminary comments

International Conventions and other international instruments on the safety of ships and life at sea have been created around the presence of a crew on board the ships. The Argentine Navigation Act and other Argentine domestic regulations follow the same principle.

In order to accept the operation of unmanned ships, the safety of ships and life at sea, the security and environmental protection levels resulting from the operation of ships with a crew on board must be maintained or even improved. This is, more than a matter of law, a technical issue.

The Argentine Republic is a state party in the main International Conventions regarding the safety of ships and life at sea and it is a well-established practice of our maritime authorities to follow and adopt OMI technical regulations on the seaworthiness of ships, which gives effect to generally accepted international rules and standards.

It is doubtful that the Argentine Republic would modify its regulations in order to admit unmanned ships in Argentine waters without the previous admission at the international level by way of International Conventions or OMI regulations.

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 computerized collision avoidance system, without any human supervision,

constitute a "ship" under your national merchant shipping law?

Article 2 of the Argentine Navigation Act (act 20.094) states that a vessel is any floating construction destined for navigation. There are no further requirements for a construction to be considered a vessel but to be a construction with the capacity to float and to be intended to sail. There is no need for a vessel to have a determined size or gross tonnage, it does not need to be intended to be used for transportation purposes and it does not require to have a crew on board to be considered a vessel. Moreover, in the case of the pontoon Plaza Libertad the Argentine courts have stated that a floating construction without a crew, without an engine and without a steering gear, is a vessel as she has the capacity to sail ("Sonaco SRL v. Yacimientos Petrolíferos Fiscales", LL 49-801). Therefore, in principle the conclusion may be that a cargo ship controlled remotely by radio communication or controlled autonomously by a computerized collision avoidance system, without any human supervision, constitute a "ship" according to Argentine law. However, this conclusion does not mean that unmanned ships registration shall be accepted by the National Register of Ships. (The Plaza Libertad was a pontoon without a crew on board, but it was not a craft controlled neither remotely by radio communication nor controlled autonomously without human supervision on board; the Plaza Libertad was governed during its operations by a crew on board of a tug boat.)

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

Article 52.a) of the Argentine Navigation Act prescribes that in order to register a ship in the Argentine Register, regulatory requirements regarding construction and seaworthiness, (issued by Coastguard's Naval Technical Division) must be fulfilled.

At present, in Argentina there are no rules regarding the registration of unmanned ships controlled remotely by radio communication or controlled autonomously. The Argentine Navigation Act and the whole set of seaworthiness and safety regulations are based on the existence of a crew on board, so unmanned ships would not be registered by the National Registry of Ships (the sole exceptions are the barges with no crew on board, which are displaced by a tug or a pusher boat with crew on board).

The Argentine Republic is a contracting party in most of the main International Conventions on vessels and human life at sea safety and our maritime authorities usually follows international regulations (particularly IMO regulations) regarding vessels safety, so in

principle we cannot expect that new domestic regulations be enacted without a previous IMO input.

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

No, there is no such mechanism or procedure in Argentina.

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.

According to Article 120 of our Navigation Act, the Captain is the person in charge of the ship´s management and governance. Article 131 of the same act prescribes the captain´s duties and powers, and particularly article 131.b) imposes the Captain with the obligation of being at the bridge during different maneuvers. Those rules were not designed for remote control so, based on the available technology, it would be necessary to decide which regulations would be mutatis mutandis applicable. It would also involve the modification of some provisions of our legal regime in order to consider the chief on-shore remote-controller to be the master of the vessel while in charge of the ship´s management and governance.

1.4.2. the chief pre-programmer on an autonomous ship.

The chief pre-programmer of an autonomous ship could be considered a vessel supplier as he is the provider/ programmer of computer programs, but cannot be consider to be the captain of the vessel.

1.4.3. another "designated" person who is responsible on paper, but is not immediately involved with the operation of the ship.

A person responsible by regulations, but not immediately involved with the operation of the ship, is unlikely to constitute the master of an unmanned vessel.

1.5.1. Could other remote-controllers constitute the "crew" for the purposes of your national merchant shipping laws?

Other remote-controllers supervision (e.g. the person handling the rudder's remote-joystick, or the person remote-controlling the engines or other mechanisms or systems) mutatis mutandis may be considered a crew-member, but this possibility depends on the available technology.

2. United Nations Conventions 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, right of passage, right of coastal and port states to intervene and duties of flag states) in the same way as corresponding manned ships are treated?

Argentine Republic sovereignty extends to the territorial sea of 12 miles from the baseline, recognizing to foreign ships the right of sailing through as far as those ships comply with international and Argentine rules (Argentine Act 23.968, article 3°, and UNCLOS, articles 2°.1, 17,19, 21.1.a y 4).

It is important to highlight that according to UNCLOS Article 21.2., coastal state laws and regulations are applicable to the design, construction, manning or equipment of foreign ships as far as these give effect to general accepted international rules or standards (UNCLOS, article 21.2).

Members of our Association have pointed out that unmanned nuclear ships and unmanned ships with radioactive products or waste on board, should not be considered included in UNCLOS article 23.

At present International Conventions and other international regulations, and Argentine regulations on safety of ships and life at sea are based in the presence of a crew on board.

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 inconsistences 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?

Article 94 of UNCLOS prescribes several duties to the flag states. Those duties have been established taking only manned vessels into account considering that if today unmanned vessels are still prototypes, in the seventies and eighties when UNCLOS was drafted, they were science fiction.

Depending on the technology available, in order to assure levels of safety that are at least equal to the safety level of ships with a crew on board, paragraph (3) and (4) of UNCLOS article 94 should be applicable mutatis mutandis to solve potential inconsistencies between the provisions of article 94 and the operation of unmanned ships through measures at IMO (under paragraph -5- of the same Article), without further measures.

Therefore, in order to accomplish article 94.3, paragraph a), all States should enforce all the necessary measures for unmanned ships flying its flag to ensure safety at sea related to the construction, equipment and seaworthiness of ships. Paragraph b) includes the manning of ships, labor conditions and the training of crews. This can be applicable mutatis mutandis considering the remote way in which said vessels are manned, including the training of those remote crew members, the extent of the shifts, etc. Regarding the use of signals stated in paragraph c) of article 94, it might be required that every unmanned vessel should provide visual and communication signals of its condition. Also, there should not be any inconsistency in requiring that unmanned ships are surveyed by a qualified surveyor of ships, and has not on board as requested, but in used remote-charts, nautical publications and navigational equipment and instruments as are necessary for an appropriate and safe navigation of the ship. There should not be any inconsistency in requiring that all ships including unmanned vessels should be in charge of a master and officers with appropriate qualifications to man remote vessels, including navigation, communication and engineering skills (article 94, 4. b). In addition, the remote master, officers and crewmembers should be fully conversant with and required to observe the applicable international regulations concerning the safety of life at sea, etc. as required in article 94.4. c). There should not be any inconsistency to request States with unmanned vessels to conform to generally accepted international regulations, procedures and practices and to take any steps that may be necessary to secure their observance (article 94.5).

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?

Regulation 14 of Chapter V of SOLAS prescribes that all States should adopt measures to ensure sufficient and efficient crew and should issue the minimum safe manning document. A working language is required for safety reasons.

The Argentine Coastguard determines the minimum safety crew that should be on board the vessel and issues the minimum safe manning document, as stated in the Coastguard Rule OM Nº 3 of 2009. According to said Rule and the Guidelines therein attached, unmanned vessels have not been taken into account and to this date it seems that the authority does not have the discretion to allow unmanned operations. An amendment to Rule OM Nº 3 of 2009 might be needed.

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?**

According to Regulation 15 of SOLAS the design and arrangement of navigational systems and equipment on the bridge and bridge procedures shall be taken with the aim of facilitating the tasks to be performed on the bridge and to promote an effective and safe bridge resource management. These requirements and others of Regulation 15 of SOLAS could be satisfied by an equivalent shore-based facility with a visual and aural stream of the ship´s vicinity.

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.)?

The master of a ship at sea in the conditions of Regulation 33 of Chapter V is obliged to proceed at all speed to assist persons in distress. An unmanned vessel unable to provide assistance at least at the same level of efficiency than a vessel with a crew on board should not be admissible. The obligation to assist persons in distress should not be ignored by the law of the seas. Safety is IMO's most important responsibility.

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?

Rule 8 a) of the COLREG states that any action to avoid collision shall be taken in accordance with the Rules of this Part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of "good seamanship". Now, depending on the available technology the operation of an unmanned ship without any on board personnel should not be considered per se to be contrary to the duty / principle of "good seamanship". If remote controllers have been dully trained and certified and they have the ability to react to the prevailing weather and traffic conditions and to manage and solve the multiple problems that arise in navigation, an unmanned "ship" without any on board personnel should not be considered contrary to the duty of "good seamanship". The bottom line must be that the operation of unmanned vessel should be, at least as safe as the operation of a traditional vessel.

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?

If the autonomous operation system without on board personal or any human supervision have the skills to react to the prevailing weather and traffic conditions, and to manage and solve the multiple problems, in principle, it should not be considered contrary to the duty of “good seamanship”. Again, the bottom line must be that the operation of unmanned vessel should be at least as safe as the operation of a traditional vessel.

4.3. As interpreted under national law, could the COLREG 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?

Colreg Rule 5 requires to maintain at all times a proper look-out by: i) sight, by ii) hearing as well as by iii) all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision. A proper look-out could be satisfied by a camera to have an appropriate sight of the surroundings together with aural censoring to transmit the ship´s vicinity to other vessels and to listen to the sounds. Furthermore, transponders to avoid collisions, with the appropriate remote watches for remote-controlled vessels or alarms and random controls of autonomously controlled vessels, should be considered. We insist: the bottom line must be that the operation of unmanned vessel should be, at least as safe as the operation of a traditional vessel.

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?

Rule 18 prescribes which vessels should keep out of the way and states that, except where Rules 9, 10 and 13 otherwise require: (a) a power-driven vessel underway (b) a sailing vessel underway and (c) a vessel engaged in fishing when underway shall keep out of the way of a vessel not under command.

“Vessel not under command” means a vessel which through some exceptional circumstance is unable to maneuver as required by the Rules and is therefore unable to keep out of the way of another vessel.

Depending on the available technology, It does not seem that an unmanned ship, whether controlled remotely by radio communication or controlled autonomously is a vessel not under command because in fact it is under remote command. Nevertheless, it should be considered if special rules for vessels remotely controlled should be necessary.

5. The International Convention on Standards of Training Certification and Watch 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?

Article 3 of the STCW Convention states that said convention applies to seafarers serving on board seagoing vessels. It should be pointed out that Article 3 has some exceptions and states that the STCW Convention does not apply to seafarers serving on board: i) war ships; ii) fishing vessels; iii) yachts not serving in trade and iv) wooden ships of primitive built. This means that the STCW has not considered the crew that might be controlling the vessel remotely, neither to include them nor to exclude them.

Therefore, the STCW does not apply to those crew members remotely controlling the vessel.

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? 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)?

According to Part 4 of Section A-VIII/2, an effective and appropriate watch are maintained at all times for the purposes of safety while the ship is anchored or moored, and if the ship is

carrying hazardous cargo, the organization of such watch or watches take full account of the nature, quantity, packing and stowage of the hazardous cargo and any of the special conditions prevailing on board, afloat or ashore. The rule does not explicitly state that the watch must be with the crew on board but this is implicit taking into account that unmanned vessels were not taken into account when the STCW was drafted. Even if it can be interpreted that the rule does not preclude remote watches and that Part 4 of Section A-VIII/2 is satisfied where the ship is remotely controlled, for the sake of good order, said rule should be amended to allow them.

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 this case, as the collision damages would have been caused solely by a failure of the computerized navigation / collision, the manufacturers of the system or of the supplier of the autonomous system service should be considered liable for the consequences of its malfunctioning, but vis a vis third parties the duty to exercise due diligence to make and maintain the ship seaworthy, and properly man, equip and supply the ship, rests on the ship-owner. These obligations are non-delegable, and are not discharged by turning the ship over to impeccable builders, repairers or supplier, and it must also be pointed out that said failure would not be considered “force majeure” for the shipowner, taking into account that in order to be held as such, the event should be not only be extraordinary, inevitable and unpredictable, but also external. As the failure is not external the ship-owner would also be held liable for the collision damages with a recovery action against the manufacturers of the autonomous system or the supplier of the service.

In a case in which the collision was caused by the failure of the electric system of the steering gear of a tug, it was proven that the system had not been tested for a long time and it had been wrongly welded. Therefore, it was not considered force majeure and the

shipowner was held liable for the collision (Agencia Marítima Petrozan S.R.L. c/ Trans-Ona s/ cobro de pesos, CNFed, Court II, 12th April 1991).

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?

Considering that, as no man would be on board the vessel and that it is also possible that no man would be immediately behind the operation of the vessel in case of vessels controlled autonomously, the cause of the damage can be the vessel itself and this can pave the way to strict liability.

However, in order to apply strict liability, a few barriers should be lifted. First of all, our Navigation Act Nº 20.094 following the 1910 Collision Convention only makes the vessel (shipowner, captain or crew) responsible for the collision and the damages. Therefore, it would be difficult to consider a vessel liable for a collision without proving the fault. Secondly, article 2 of the 1910 Brussels Collision Convention indeed is linked to no-fault situations. This is so because article 2 does not make the vessels responsible in two cases of no-fault as force majeure and when the cause of the collision is left in doubt. Third, the unmanned vessels controlled remotely will have a distant captain and crew at her command and an unmanned vessel controlled autonomously will have been pre-programmed by a person that might be considered the captain of the ship and will also be controlled at distance. Therefore, the shipowner of the vessel whose pre-programmer or whose controllers had been at fault, would be the one liable for the collision. In addition, it can be said that the Argentine Supreme Court has been reluctant to accept strict liability in maritime law e.g. in cases of damages caused by a vessel to a berth (CSJN Sulfacid SACI c/ capitán y otros buque Rio Bravo,16/6/88).

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