



CMI QUESTIONNAIRE ON UNMANNED SHIPS

1. National law

1.1. Would a "cargo ship" in excess of 500 GT, 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?

No, both types of unmanned ships would not constitute a ship since Croatian Maritime Code (Official Gazette, 181/2004, 76/2007, 146/2008, 61/2011, 56/2013, 26/2015, MC), in Chapter V (titled: Vessel), Art. 76, para 2, p. 1, determines that a ship is deemed seaworthy provided that she, among other things, satisfies the minimal qualified crew requirement.

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

Yes, due to reason stated in reply at 1.1.

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, because the Croatian Maritime Code determines all relevant categories in Art. 5.

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

No, because Art. 125, para 1 of Croatian Maritime Code defines the crew as master and other persons on-board a ship.

1.4.2. The chief pre-programmer of an autonomous ship

No, same as in the answer at 1.4.1.

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

No, same as in the answer at 1.4.1.

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

No, same as in the answer at 1.4.1.

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?

Each jurisdiction allowing the entry of unmanned vessels into their waters should first ensure the technical capabilities of assuming command over such a vessel in case anything goes wrong (security threats, safety and environmental threats, cyber threats, etc.). This should be determined at an international level prior to any considerations with regard the relevant changes in both the domestic and international law.

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 onboard 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?

This, among other things, depends on what sort of a definition of "seaworthiness in an unmanned context" will present itself. Obviously, whoever will remotely supervise the operation of an unmanned vessel should adhere to all qualifications and standards as are presently required for the ship's master (and other relevant crew), in order to be able to assume direct control in case of an emergency. Question remains should the Coastal States establish a special service that will employ a number of qualified persons ready to assume the control if the shipping company is unable to do that itself.

3. The International Convention for the Safety of Life at Sea, 1974 (SOLAS)

- 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 onboard personnel or does the relevant authority have the discretion to allow unmanned operation if satisfied as to its safety?

The minimum of qualified crew is required (as per answer 1.1.).

- 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 context 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?

No, as per reply at 1.1 and Art. 68 of Croatian Maritime Code et seq. (pilotage) and relevant secondary legislation on pilotage.

- 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, Art. 765 of Croatian Maritime Code specifically defines instances when a ship's master is not under an obligation to provide assistance at sea. Lack of on-board crew is not listed.

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

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

Yes, as per reply at 1.1.

- 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 COLREG, as interpreted nationally, regardless of the safety credentials of the autonomous control system?

Yes, as per reply at 1.1.

- 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?

The Croatian By-Law on Safety of Maritime Navigation in Internal Waters and Territorial Sea of the Republic of Croatia and Means and Conditions of Performing Supervision and Management of Sea Transport (Official Gazette, 79/2013, 140/2014, 57/2015) does not define the term "look-out", although it contains the same provision (Art. 8) as present in COLREG Rule 5. However, it has to be noted that the rules of the Maritime Code prevail (MC being the primary legislation source, as per reply at 1.1.).

- 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?

No, the same By-Law defines (Art. 6, para 1., p. 6) such an instance under the term "vessel unable to manoeuvre", and does not refer to a lack of crew on-board.

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?

One would assume that the STCW Convention should be made applicable to those who are remotely operating the unmanned vessels (as per under 2.2.), once such vessels are found to be safe for use.

- 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)?

Obviously, the words "physically present" are in a direct collision with the word "remote". Unable to respond to the second question, clarification is required.

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 accordance with the Croatian Maritime Code, the shipowner and / or ship operator are principally responsible and liable for ship's collision damage (fault based liability) and damage in tort (either strict liability or fault based liability). The manufacturers of autonomous systems may be responsible and liable towards the shipowner and / or ship operator in accordance with the general rules on product liability (Croatian Obligations Act).

- 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?

An introduction of a strict liability model with regard the operation of autonomous ships requires a legislative effort but should, prior to national, be considered at international level.