

COMITÉ MARITIME INTERNATIONAL
REPLIES OF FRENCH MARITIME LAW ASSOCIATION¹
TO THE QUESTIONNAIRE ON UNMANNED SHIPS

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?

1.1: Under French law, the definition of the ship is given by Article L. 5000-2 of the French Transport Code: "*Any floating craft built, equipped or assigned to commercial, fishing or pleasure craft (...) or engaged in administrative, industrial or commercial public services*".

Most the doctrine holds three criteria: the ship is a floating craft, equipped with a means of propulsion and able to face the perils of the sea.

The presence of a crew is therefore not a criterion for the qualification of the ship².

There is therefore no reason, under French law, to refuse the classification of a ship to an unmanned ship, whether it is remotely controlled or autonomous.

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

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² Except to consider that a ship without crew would not be able to face the perils of the sea. However, currently undeveloped crewed ships seem able to meet this criterion.

1.2: In France, the registration procedure makes no reference to the crew. This is not a criterion for registration³.

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?

1.3: The authority responsible for flag control has the power to accept derogations from certain technical provisions provided that the measures taken are considered to be equivalent to the requirements of safety. The derogations will certainly also depend on the operation and the navigational area in which this floating object without a seafarer will sail.

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

1.4: Article L. 5511-4 of the French Transport Code defines the master as "the person who actually exercises the command of the ship". It is not expressly stated that the master must be on board the ship.

1.4.1: It is therefore not inconceivable that the chief onshore remote-controller could be considered the captain, as long as it is considered that the person is in fact in command of the unmanned ship.

1.4.2: The chief pre-programmer of an autonomous ship, a priori, cannot be qualified as captain: to program is not to command.

1.4.3: If the person is not directly involved with the command of the vessel, it is not possible to qualify him as master.

It should also be recalled that the duties of master are reserved for persons holding professional qualifications⁴.

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

³ Article L. 5112-1-1 of the French Transport Code does not require the presence of a crew as a condition for registration. Article D. 5112-1 of the same Code, which lists the mandatory entries in the certificate of registration, makes no allusion to the crew.

⁴ Decree No. 2015-723 of 24 June 2015.

1.5: The answer is negative: pilots on land of the ship without crew cannot constitute a crew. A crew consists of sailors. Sailors are defined as "seafarers engaged in activities directly related to the operation of the ship" (article L. 5511-1). However, seafarers are defined as "persons working on board a ship" (same text). The result is that a sailor is necessarily embarked. It could not be otherwise than by admitting that a crew consists not only of sailors. In addition, seafarers must hold professional qualifications and qualifications corresponding to the capacities they must have and to the duties to be performed (Article L. 5521-2).

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?

2.1: If we consider, in accordance with the answer 1.1, unmanned ships are ships, it would mean that this ship would have the same rights and obligations as a typical manned ship. Today, French Law of the Sea is compiled in the Ordonnance n° 2016-1687 of 8 December 2016, on maritime areas being a matter for sovereignty or jurisdiction of the French Republic. This act doesn't refer to the crew. In the UNCLOS, rights and obligations of ships are not linked by the presence aboard of a crew. However, perhaps some adaptations of the Convention will be necessary⁵.

2.2. Paragraphs (3) and (4) of UNCCOS 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?

⁵ E.g., articles 27 (criminal jurisdiction), 97 (collision), 98 (assistance) or 211 (pollution) involve captain and/or crew in legal effects. So, they would require to be adapted to unmanned ships. A weakening of coastal states powers could occur, in particular in the territorial sea or exclusive economic zone: the ship, which has an autopilot, would be more difficult to apprehend without a crew aboard for the public authorities of the coastal state.

2.2: Obligations stated by article 94 § 3 of the UNCLOS are not linked by the presence aboard of a crew. The objective is the safety of navigation: these obligations are applicable to unmanned ships.

Unmanned ships, however, are not perfectly compatible with the provisions of the article 94, § 3 and 4. Some adjustments are necessary, in particular about:

- training and qualification of on-shore remote-controllers, or pre-programmer of the autonomous ship
- working conditions (working time, vacation, etc.) of these persons

These adjustments don't require a deep change of the UNCLOS. Instead of talking about captains, officers and crews, article 94 § 4, c should talk about ship taken in a whole, or include the idea that ships can be unmanned in the future.

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?

3.1: French law is silent on this issue : it is a matter of negotiation between the shipowner and the Administration. It is for the Shipowner to determine the minimum crew⁶. The maritime affairs Administration will approve or reject this proposal. The answer to this question is therefore positive: the Administration can authorize the unmanned ships, if it considers that the conditions , especially safety ones, are fulfilled.

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?

⁶ Article L. 5522-2 of the Transports code provides that: « Any vessel is staffed with seamen in sufficient number and with sufficient professional qualification to ensure the safety and security of the vessel and the persons on board together with the obligations of watch, work duration and rest ». This very same text specifies that: « The document for minimum staff designates the document by which the Maritime Authority certifies that the staff of the vessel satisfies with all requirements of the relevant international conventions according to the type of vessel and the national measures taken for their application ».

Article 1 of decree n° 67-432 du 26 mai 1967 relating to the staffing on board of the merchant, fishing and pleasure fleet provides that: « the staff is fixed by the shipowner if not previously determined by agreement between the interested parties or their representatives. It is submitted by the shipowner, to the approval of the Maritime Affairs Administration territorially in charge which appreciated if it complies with the rules relating to safety of navigation and the work duration ».

3.2: This question is more technical than legal.

One can simply observe that the last technical developments seem to show that the shore pilot has the equipment ensuring the necessary visual and sound watch. The tools and softwares for visual watch can even be more reliable than the human vision, who can be tired, whose attention can get distracted, etc.

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.)?

3.3: The strict minimum would be that the unmanned ship are in a position to convey or report the distress signal or the distress situation she detected herself.

Whether the unmanned ship can herself provide assistance or not is a question to which the answer is depending on technical factors. Either the unmanned ship is technically able to provide assistance, and she then must have the obligation to do so. Or the unmanned ship is not technically able to do so, and the inability provided in regulation 33 may be applied. It is however essential to remind that providing assistance is one of the most important principle of maritime law. Unmanned ships should therefore only be authorized to sail if they are technically able to provide assistance⁷.

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?

4.1: For the time being, it is difficult to answer to this question. The answer depends on the quality of the on board equipments. Regarding the unmanned "ship" controlled from the land, the «*good seamanship* » principle is not unconceivable because there exists human supervision. It will however have to be redefined.

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?

4.2: As for the previous questions, it is difficult to answer this question for the time being.

⁷ That means unmanned ships must be equipped with ways of recovery at sea, and ways to ensure the protection of rescued persons aboard (cabins, food, etc.).

The answer depends on the quality of the on board equipment. In the case of completely autonomous “ship” the « *good seamanship* » principle cannot be applied. A substitute will therefore have to be imagined, such as a « *safety seaworthiness* » principle.

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?

4.3: The answer of this question is the same as the one stated in 3.2.

The question is more technical than legal. If scientific and technical progress ensure the sight and hearing watch, in particular by projecting an image at 360°, the COLREG Rule 5 should be satisfied.

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?

4.4: A ship navigating without an on-board crew can perfectly maneuver despite the absence of a crew on-board : it should not be considered as a ship "vessel not under command" or "vessel restricted in her ability to manoeuvre" (under the COLREG rule 3 and 18) ...

A ship without an on-board crew should have anti-collision devices and instruments that allow the pilot on land to see the other ship.

There is therefore no objective reason to consider that ships without an on-board crew should be stand-on vessels.

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

5.1: STCW Convention’s provisions are not applicable to remote controllers, because they are not sailors or seafarers.

About remotely controlled unmanned ships, the STCW Convention should be completed, to be applicable to remote controllers. In particular, these amendments will have to specify required certificates for on-shore work.

These amendments will also address the issue of obligations of seagoing service (who are required for continued professional competence and revalidation of certificates: Manila amendments of the STCW Convention, section A-I/11). May on shore remote control be qualified of seagoing service?

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)?*

5.2: The STCW Convention should be applied to all those involved, on shore, in the steering of the ship. Thus, an adaptation of this Convention to take into account the specificities of unmanned ships seems necessary.

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?*

6.1: In the relationship between the unmanned ship and the collided vessel, the specific rules on collision are applicable, as they are construed as a specific law excluding the application of common law. Since, according to the question, the only vessel deemed to be at fault is the unmanned vessel, it would be fully liable, with the possibility for the shipowner to limit his liability.

However French caselaw admits the application of common law on civil liability when deciding how to apportion the relevant debt.

Between the shipowner and the manufacturer of the autonomous system several situations could be considered, subject to different specific contractual provisions :

- If the malfunction is caused by a hidden defect (in the conception and/or in the manufacturing of the autonomous system) that existed before delivery of the vessel : the liability would lie on the manufacturer ;
- If this hidden defect could have been discovered during regular periodic maintenance operations, the liability could be divided between the manufacturer and the shipowner ;
- If the cause of the malfunction cannot be attributed to a hidden defect existing before delivery of the vessel, the liability would lie on the shipowner.

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?

6.2: The liability regime for collision is a derogation to the French ordinary tortious liability regime, and it is required to prove the fault of the vessel to claim successfully against it, as ruled several times by the Supreme Court.

Article 2 of the 1910 Convention is a mere common-sense rule: it is not always easy to determine whether a collision is faulty, and who was at fault. It is not a rule meant to lead to a strict liability regime⁸.

⁸ The French transports code (articles L 5131-3 and L 5131-4) replicates articles 2 to 4 of the 1910 Convention.

Comments:

Since act n°2016-816 of 20 June 2016, French Law is considering unmanned ships, but only when they are ordered from another ship (e.g., C. transp., art. L. 5111-1-1; L. 5121-2; L. 5121-3). Such ships can nevertheless be excluded from the replies to the questionnaire on unmanned ships, because they are peripheral to the ship from which they are driven. The questionnaire is also not considering the question.

French texts, nor the international texts, are not currently considering the issue of unmanned ships. The answers are necessarily prospective, in order to determine the adaptability of the existing texts on this issue.

CMI emphasizes there is a strong difference between shore-based remote controlled ships and autonomous ships, who is independent thanks to preprogrammed instructions. In the first, there is still some human intervention: even if he's located far away, the pilot can react in real time.

Another important issue will be the one to know which ships can be unmanned ships. It will be important to determine what maritime activities could be performed by unmanned ships: shipping? Port services? Fishing? passenger transport?