

3nd International Maritime and Transport Law Course

MARITIME AND TRANSPORT LAW COLLOQUIUM 2022

Inter-University Centre Dubrovnik

5 - 9 September 2022

International Maritime Organization: Regulatory Approach to MASS

Igor Vio

University of Rijeka - Faculty of Maritime Studies

DEFINITION

MARITIME AUTONOMOUS SURFACE SHIPS (MASS) are vessels which are capable of controlled movement on the water with reduced crew or in the absence of any onboard crew.

Their introduction causes the need for creating an international legal and regulatory framework that will cover a wide spectrum of safety, security, liability and insurance issues.

The main four degrees of autonomy are:

1. crewed ship with automated processes and decision support
2. remotely controlled ship with seafarers on board
3. remotely controlled ship without seafarers on board
4. fully autonomous ship

AUTONOMOUS SHIPS PROJECTS

- a) The Marine Autonomous Systems Regulatory Working Group (**MASRWG**) established in 2014 under the auspices of the Government of the United Kingdom of Great Britain and Northern Ireland;
- b) The Norwegian Forum for Autonomous Ship (**NFAS**);
- c) Finish research Project **AAWA** - “Advanced Autonomous Waterborne Applications Initiative” started in 2015;
- d) **MUNIN** - “Maritime Unmanned Navigation through Intelligence in Networks” – European Commission Project;
- e) **SARUMS** - “Safety and Regulations for European Unmanned Maritime Systems”, launched by European Defence Agency;
- f) **INAS** - the International Network for Autonomous Ships , which is an informal group of national or regional interest organisations worldwide on unmanned, autonomous and smart ships established on 30 October 2017.

AUTONOMOUS SHIPPING - EXAMPLES

- In Finland Rolls-Royce together with Finferries performed first autonomous voyage of Falco ship in Turku Archipelago in early December 2019. Falco, with no crew on board, used sensors and artificial intelligence for collision avoidance, as well as an autonomous navigation system.
- In Norway, container ship, Yara Birkeland, launched in 2020, is expected to reach full autonomy gradually by 2022. In both Norway and Finland, there are dedicated test areas for autonomous and unmanned ships - Trondheim Fjord is used by the Norwegian Maritime Authority and Norway's coastal administration.
- Advanced projects have been proceeding in China (also accompanied by a 'test field' for first operations).
- Japan's shipping company, NYK Line, performed a demonstration of the remote-controlled vessel across Pacific in late 2019.
- Korean companies – Samsung and Hyundai

IMO STRATEGY

International Maritime Organization (IMO) accepted the need to adopt the necessary guidelines and rules for autonomous shipping in international waters.

IMO decided to respond proactively in order to establish the extent of the need to amend the regulatory framework as to enable the safe, secure and environmentally sound operation of MASS within the existing IMO instruments.

INTERNATIONAL MARITIME ORGANIZATION CONVENTION

- **International Convention for the Safety of Life at Sea, 1974 (SOLAS)**
- **The Convention on Standards of Certification, Training and Watchkeeping 1995/2010 (STCW)**
- **International Regulations for the Preventing of Collisions at Sea, 1972 (COLREG)**
- **International Convention on Search and Rescue, 1979 (SAR)**

International Convention for the Safety of Life at Sea (SOLAS, 1974/88)

SOLAS prescribes **minimum standards** for the construction, safety equipment and necessary ship certificates.

Responsibility for compliance shall be given to the **flag state** where the vessel is registered, with the right to inspect foreign ships visiting their ports through the system of **port state control**.

States Parties to SOLAS, once they have signed and ratified the Convention must **comply** with its provisions and **verify** that all ships of their nationality meet the requirements of SOLAS.

When the conditions are met, a **certificate of compliance** is issued.

APPLICABILITY OF PROVISIONS OF SOLAS ON MASS

In case that the ship or its equipment violates (or is suspected of having violated) these requirements, the competent **port state control officers** shall have **the right to inspect** the ship when entering the PSC's area of responsibility.

The autonomous vessel is not excluded from Chapter I, therefore the terms '*must be sufficiently and efficiently crewed*' and '*must have an appropriate document on the minimum number of crew members or equivalent*', meaning that those requirements must be met, otherwise **the rule must be adapted** to reflect the new reality of the unmanned ship without crew on board.

One of the most important issues that could challenge the very essence of the autonomous ship is Chapter V. Rule 14 of SOLAS regarding the manning of ships with crew. The second is Rule 33 (Exceptional Situations: Obligations and Procedures) of the same Chapter.

The Convention on Standards of Certification, Training and Watchkeeping (STCW, 1995/2010)

The STCW Convention was adopted in 1978 and amended in 1995 and 2010. Today it applies to **seafarers on board** but not to personnel responsible for operating an autonomous ship from a remote control centre located on land nor the computer engineers who create software and hardware enabling autonomous navigation.

These professionals are *de facto* taking over the role of the ship's master and officers in control of the navigation but are not subject to the rules of the STCW.

According to Art. 94. (4) (b) of UNCLOS 1982, flag States shall ensure that each ship is 'in charge of the master holding the appropriate qualifications, in particular in maritime affairs, navigation, communications and marine engineering'.

APPLICABLE LEGAL REGIME FOR SEAFARERS AND REMOTE OPERATORS

Is it possible for an unmanned ship, by its definition, to have a master?

"Master on land" with the help of few operators can simultaneously control a small fleet of autonomous vessels. The number of such vessels permitted to be operated at once has not yet been set.

Whereas the rules of labour law would apply to remote control centre operators or developers of a fully autonomous ship, specific rules similar to those applicable to seafarers (such as the duty to report distressed signals, etc.) may also need to be adapted and applied.

However, as personnel of a control centre would not be considered for conventional seafarers, a number of questions and problems will arise and legislative intervention will be rather demanding.

International Regulations for the Preventing of Collisions at Sea (COLREG, 1972)

COLREG shall apply to all vessels on the high seas and in all waters connected to them. This formulation includes as well the autonomous vessels and according to the rule with general definitions, the word “vessel” includes every description of watercraft, including non-displacement craft, WIG craft and seaplanes, used or capable of being used as a means of transportation on water.

Although this definition does not include an autonomous vessel, it neither precludes it from being characterised as a 'vessel'.

APPLICATION OF COLREG, 1972

Since Collision Regulations were created for vessels with master and crew, it is quite natural that a variety of amendments should be introduced to all those rules that contain references to human senses of vision and hearing, as well as human behaviour that is result of rational decision making like *“precaution which may be required by the ordinary practice of seamen”*, *duty of maintenance of a proper look-out*, *“determining if risk of collision exists”*, *“action to avoid collision made in ample time and with due regard to the observance of good seamanship”*, *the execution of the last moment ‘manoeuvre in the agony of collision’ and conduct in restricted visibility.*

International Convention on Maritime Search and Rescue (SAR, 1979)

The International Convention on Search and Rescue at Sea (SAR) was adopted in 1979 with the aim to develop the International SAR Plan. The rescue of persons in distress at sea is coordinated by the national SAR organisations and cooperation between neighbouring SAR organisations where necessary.

The obligation of ships to assist ships in distress previously existed in both tradition and international treaties such as SOLAS.

The adoption of the SAR Convention created an international system covering search and rescue operations globally.

The SAR and the Guidelines for the Treatment of Persons Rescued at Sea include manned vessels and contain no mention of autonomous vessels.

SAR Regulation 3.1.9 applies in particular to the master of the vessel

APPLICATION OF SAR, 1979

UNCLOS 1982 in its provision titled “The duty to provide assistance” requires that each State 'require the master of a ship flying its flag, if it can provide assistance to any person in perilous danger at sea without serious danger to the ship, crew or passengers:

- (a) provide assistance to any person in perilous danger at sea;
- (b) continue actions in the shortest possible time to rescue people in distress;
- (c) after the collision, assist another ship, its crew and passengers.

This obviously creates a problem since the entire system is based on manned ships and it is a task for all the stakeholders to discuss the potential future inclusion of MASS in SAR operations.

ACTIVITIES OF INTERNATIONAL MARITIME ORGANIZATION

The useful initiative in this direction by several member states of the IMO was the proposal for a **regulatory scoping exercise** with regards to maritime autonomous surface ships (MASS), which was included in the agenda of the 98th session of the **IMO Maritime Safety Committee** in February 2017.

Before autonomous merchant ships start operating successfully in international trade, the shipping industry will have to apply the necessary guidelines and rules for autonomous ships' operations in international waters, that should be adopted by the International Maritime Organization.

Interim guidelines for MASS trials were adopted by Maritime Safety Committee in June 2019.

MARITIME SAFETY COMMITTEE

The MSC commenced work on the development of a goal-based instrument regulating the operation of maritime autonomous surface ships (MASS).

The MSC approved a **road map** containing a work plan for the development of IMO instruments for Maritime Autonomous Surface Ships (MASS).

The road map envisages the development of a goal-based instrument in the form of a **non-mandatory Code**, with a view to adoption in the second half of 2024 as the first stage.

Based on the experience gained in the application of the non-mandatory MASS Code, a **mandatory MASS Code** will be developed which is envisaged to enter into force on 1 January 2028.

LEG Approach

Depending on the MASS degree of autonomy:

I developing interpretations; and/or

II amending existing instruments; and/or

III developing new instruments; or

IV none of the above as a result of the analysis

i.e. for Salvage 1989: 1 (IV), 2(IV), 3 (I), 4 (I)

MSC – LEG – FAL Joint Working Group

The MSC concurred with the Legal Committee on the establishment of a Joint MSC/LEG/FAL Working Group as a cross-cutting mechanism to address common issues identified by the regulatory scoping exercises for the use of MASS conducted by each of the three Committees.

The FAL Committee will consider the establishment of such Joint Working Group in May 2022 and is expected to concur for the holding of the first meeting from 6 to 8 September 2022, subject to the approval by the IMO Council (C 127) in July 2022.

CONCLUSIONS

The important aim in research of the regulatory framework for autonomous vessels is to determine the necessary criteria, taking into account the need to preserve the protected values of maritime law.

It is necessary to redefine the guiding principles of maritime law and the catalogue of protected goods (seeking a balance between the need to facilitate trade by sea and a high level of safety and security at sea, protection of life and marine environment, rendering assistance) and adapt them to shipping based on AI

Achieving above mentioned partial goals seems to be crucial for reconstruction of the principles underlying regulatory model allowing for the operation of autonomous vessels, in which the decision-making of a human being is replaced by artificial intelligence.

THANK YOU FOR YOUR ATTENTION!

