

## IUMI Policy Agenda

### 2. Autonomous / unmanned transports

#### *Brief description*

Unmanned transports are gaining acceptance from industry and public entities as research and innovation bring the possibility of driverless trucks and vessels closer to realization. This raises some legal and liability issues that need to be resolved.

Insurers also need to address the risks related to innovative technologies and the internet of things. New types of failure modes may be introduced due to the lack of knowledge and unforeseen interdependencies in the system design, operation complexity, and environmental challenges. Cyber-attacks, connectivity, interactions between components and between technical systems and humans, and autonomy assisted accidents are among the challenges.

To become insurable, the use of autonomous systems must rely on proper industry standards, certification and classification regimes. Verification of safe performance is crucial.

#### Vessels

An unmanned vessel can be both remote controlled or fully automated, and it has been suggested that the first crewless vessel will be in service by the end of the decade. Most likely, there will be a number of variations and a stepwise progress, including the use of automated technologies with a reduced number of crew on board and for certain manoeuvres.

Numerous industry and government-run projects are driving the development, but for unmanned vessels to become a reality the regulatory framework must also be in place. Requirements concerning the person having command of a vessel, sufficient manning, training and proper lookout must be considered in international conventions (SOLAS, STCW, COLREG). In June 2017, IMO's Maritime Safety Committee (MSC) agreed to undertake a regulatory scoping exercise to determine the extent of the need to amend the regulatory framework to enable the safe, secure and environmental operation of maritime autonomous surface ships (MASS) within the existing IMO instruments. The results from this exercise will be discussed by MSC in May 2021.

In December 2018, MSC 100 agreed to maintain the initial four degrees of autonomy although focusing on levels two and three: (2) Remotely controlled ship with seafarers on board and (3) Remotely controlled ship without seafarers on board. A web platform has also been established.

Interim guidelines for trials of MASS were finalized by MSC 101 in June 2019. As a basic principle, these trials shall meet at least the same level of safety, security and

environmental protection as required for conventional vessels.

In April 2018, the IMO Legal Committee (LEG) agreed to include a new output entitled “Regulatory scoping exercise and gap analysis of conventions emanating from the Legal Committee with respect to Maritime Autonomous Surface Ships (MASS)”, with a target completion year of 2022.

There are also several other initiatives relating to legislation and insurance of autonomous vessels; Comité Maritime International (CMI) has formed an International Working Group on Unmanned Vessels, Association Mondiale de Dispatcheurs (AMD) are considering how the adoption of unmanned ships may impact marine insurance claims and the application of general average, ISO is considering a way to characterize and classify ship autonomy, and International Group of P&I Clubs has formed a working group to consider liability matters. BIMCO is drafting a standard contract for autonomous vessels, adapted from the SHIPMAN 2009 agreement, titled AUTOSHIPMAN and expected to be published in 2021. The contract will include provisions for autonomous vessel-related services and the operation of a remote control centre.

#### Trucks

Freight shipments with trucks driving in “trains” along the highway are now being tested. Truck platooning, in which two or three trucks drive in a column connected by Wi-Fi with the first truck determining the speed, enables shorter gaps between trucks. This frees up space for other vehicles, and is expected to ensure better traffic flow and speed of deliveries. Truck platooning is also said to realise up to ten per cent fuel savings, as well as reducing CO<sup>2</sup> emissions.

The European Truck Platooning Challenge demonstration project was successfully completed in spring 2016. While the test showed that technology already has come a long way, it also made it clear that in going forward there is a need for EU harmonisation of rules of the road and rules for drivers.

In January 2017, Singapore Ministry of Transport and PSA Corporation signed agreements with two automotive companies to design, develop and test an autonomous truck-platooning system for use on Singapore’s public roads (between ports).

In 2019, ZPMC Smart Solutions Group completed a phased R&D testing of five all-electric unmanned vehicles in the Tangshan Port Container Terminal (China).

#### *Relevant authority / organisations and documents*

- **IMO:**
  - MSC95/INF.20: The IMO regulatory framework and its application to Marine Autonomous Systems, submitted by the United Kingdom, International Associations of Institutes of Navigation (IAIN) and the Institute of Marine Engineering, Science and Technology (IMarEST), 14 April 2015.

- [MSC98/20/2](#): Maritime Autonomous Surface Ships, Proposal for a regulatory scoping exercise, submitted by Denmark, Estonia, Finland, Japan, the Netherlands, Norway, the Republic of Korea, the United Kingdom and the United States, 27 February 2017.
- [MSC98/22/7](#): Impact of new and advanced technologies to maritime transport and the regulatory framework, submitted by Denmark, Estonia, Finland, Japan, Norway, Singapore, Sweden and IMarEST, 28 March 2017.
- [MSC98/20/13](#): Comments on MSC98/20/2, submitted by the International Transport Workers' Federation (ITF), 13 April 2017.
- [MSC99/INF.3](#): Final report – analysis of Regulatory Barriers to the use of Autonomous Ships, submitted by Denmark, 18 January 2018.
- [LEG105/11/1](#): Proposal for a regulatory scoping exercise and gap analysis with respect to Maritime Autonomous Surface Ships (MASS), submitted by Canada, Finland, Georgia, the Marshall Islands, Norway, the Republic of Korea, Turkey, CMI, ICS and P&I Clubs, 19 January 2018.
- [MSC99/INF.5](#): Report of a survey on what maritime professionals think about autonomous shipping, submitted by IFSMA and ITF, 9 February 2018.
- [MSC100/INF.3](#): Regulatory scoping exercise for the use of maritime autonomous surface ships (MASS) – Initial review of IMO instruments under the purview of MSC, note by the Secretariat, 9 August 2018.
- [MSC100/5/1](#): Proposal for a classification scheme for degrees of autonomy, submitted by ISO, 31 August 2018.
- [LEG106/8/1](#): Outcomes of MSC 99 and MSC 100 regarding MASS, Secretariat, 11 January 2019.
- [LEG106/WP.5](#): Report of LEG Working Group on MASS, 29 March 2019.
- [MSC.1/Circ.1604](#): Interim guidelines for MASS trials, 14 June 2019.
- [ISWG/MASS1/6](#): Report of the ISWG MASS to the Maritime Safety Committee, 23 September 2019.
- [LEG107/8](#): Summary of results of analysis of IMO instruments under the purview of the Legal Committee, submitted by CMI, 13 December 2019.
- [MSC102/5/16](#): Summary of result analyses of IMO instruments under the purview of the Maritime Safety Committee, submitted by CMI, 11 February 2020.
- **University of Gent**: Article in Journal of International Maritime Law on the law of unmanned merchant shipping – an exploration, Professor Dr Eric Van Hooydonk, 2014
- **UK Marine Industries Alliance - Maritime Autonomous Systems Regulatory Working Group (MASRWG)**:
  - Code of practice – 2<sup>nd</sup> version, 2 November 2018.
  - <http://www.ukmarinealliance.co.uk/MAS>

- **Advanced Autonomous Waterborne Applications Initiative (AAWA):** <https://www.utu.fi/en/units/law/research/research-projects/Pages/aawa.aspx>
- **University of Southampton:** Presentation on the navigation of unmanned ships and the collision regulations, Robert Veal, Research Fellow, Institute of Maritime Law.
- **Maritime Unmanned Navigation through Intelligence in Networks (MUNIN):** <http://www.unmanned-ship.org/munin/>
- **Norwegian Forum for Autonomous Vessels:** <http://nfas.autonomous-ship.org/>
- **Denmark:**
  - Pre-study. Cooperation between Danish Maritime Authority & the Technical University of Denmark (MSC 98/INF.13).
  - Danish Maritime Authority/Rambøll/Core Advokatfirma: Analysis of regulatory barriers to the use of autonomous ships, December 2017.
- **The European Truck Platooning Challenge:** <https://www.eutruckplatooning.com/default.aspx>
- **ONE SEA Autonomous Maritime Ecosystem (Finland):** Finnish Maritime Industries, ecosystem for autonomous marine transport in the Baltic Sea in 2025.
- **European Parliament:** Resolution on Civil law rules on robotics, 16 February 2017.
- **CMI:** International Working Group on “Maritime Law for unmanned craft”; MSC 99/INF.8: Work conducted by the CMI WG, 13 February 2018.
- **Centre for Autonomous Marine Operations and Systems (NTNU AMOS),** Norwegian University of Science and Technology: Risk management of autonomous marine systems and operations, Paper for OMAE17 in Trondheim – Norway, June 2017.
- **Classification societies:**
  - **Lloyd’s Register:** Cyber-enabled ships – ShipRight procedure assignment for cyber descriptive notes for autonomous & remote access ships, Version 2.0, December 2017.
  - **Bureau Veritas:** Guidelines for Autonomous Shipping, December 2017.
  - **DNV GL:** Autonomous and remotely operated ships (DNVG-CG-0264), September 2018.
- **CORE Advokatfirma & Cefor:** Maritime autonomous surface ships – zooming in on civil liability and insurance, 10 December 2018.
- **ShippingLab:** <http://shippinglab.dk/>
- **European Maritime Safety Agency (EMSA):** Study of the risks and regulatory issues of specific cases of MASS (SAFEMASS), DNV GL report, 25 March 2020.

#### *Timeline / important dates*

- MUNIN: 2012 until August 2015.
- AAWA: March 2015 until June 2017.



- CMI questionnaire to National Maritime Law Associations, 29 March – 31 May 2017.
- IUMI webinar: Legal aspects, Dr M. Guth, Dabelstein & Passehl, 11 May 2017.
- MSC 98: 7-16 June 2017.
- Unmanned Cargo Ship Development Alliance, formed 28 June 2017.
- MSC scoping exercise June 2017 - June 2020.
- LEG 105: 23-25 April 2018.
- EU research programme Horizon 2020: 2018-2020.
- LEG scoping exercise agreed April 2018. Target completion year 2022.
- MSC 100: 3-7 December 2018.
- IUMI webinar: Update on regulatory developments for Maritime Autonomous Surface Ships (MASS), Dr L. Wiedenbach, ASD, 29 January 2019.
- IMO web platform: March 2019.
- FAL regulatory scoping exercise – final consideration and results, tbd
- MSC 103: 3-14 May 2021.

*IUMI will:*

- Monitor ongoing industry and government-run projects, and provide input as appropriate.
- Monitor scoping exercises performed by the IMO and take part in discussions on regulatory amendments.
- Encourage classification societies to take an active role in both technical and operational risk aspects of increasingly autonomous vessels.
- Encourage the development of industry standards, certification schemes and class requirements for autonomous systems and remote control centres.
- Participate in the LEG web platform working group.