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**Economic Commission for Europe****Inland Transport Committee****Working Party on Inland Water Transport****Working Party on the Standardization of Technical  
and Safety Requirements in Inland Navigation****Fifty-seventh session**

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Item 6 of the provisional agenda

**Automation in inland navigation****European Boating Association Position Statement on  
Autonomous Shipping****Transmitted by the European Boating Association****Executive Summary**

1. Autonomous shipping technology is developing faster than the regulations to manage the interaction between autonomous vessels and traditionally crewed vessels. Although the International Maritime Organisation (IMO) and the Central Commission for the Navigation of the Rhine (CCNR) have both launched activities to review the regulatory regime for their specific sectors, there is a need for urgency in order to keep up with developments in the industry that are already taking place. Projects have already been launched to make the concept a reality.
2. The European Boating Association<sup>1</sup> (EBA) is monitoring the developing technology and the emergence of ships operating with varying degrees of autonomy closely, to ensure that there is no detrimental impact on safety of navigation for Recreational Boating.<sup>2</sup>
3. The International Regulations for the Preventing Collisions at Sea place obligations on the conduct of vessels in any condition of visibility, conduct of vessels in sight of one another by day and by night and conduct of vessels in restricted visibility. CEVNI, the European Code for Inland Waterways contains the rules of the road applicable to the traffic on inland waterways in the United Nations Economic Commission for Europe (UNECE) region. CEVNI constitutes the legal and technical basis for national inland waterway codes in UNECE member States.
4. As technology develops and vessels are capable of operating with less reliance on the human element, careful consideration needs to be given to how such vessels can integrate safely with existing, traditionally manned vessels of all sizes.
5. More and more vessels are being trialled, testing various degrees of autonomy, but as such operations scale up, steps need to be taken to ensure that they can share the waters they operate on safely. However, it is a fact that the vast majority of vessels will still have crew on board to operate and control shipboard systems and functions including their navigation.

6. As detailed in the EBA's position statements on tourism,<sup>1</sup> recreational boating and cruising boat tourism are important elements of the European Union economy. In order to increase the contribution these activities make, efforts should be made to reduce unnecessary bureaucracy and expense. It is therefore important that in legislating to accommodate vessels which are not manned in the manner required by existing legislation, burdens are not transferred to existing users (in particular recreational boats).

7. Autonomous shipping should be required to adapt to the current environment rather than have the environment adapt to make it possible for autonomous craft to operate.

## Background

### What is an autonomous ship?

8. An autonomous ship has been defined as a ship which, to a varying degree, can operate independently of human interaction.

9. The International Maritime Organization (IMO) has been pressured into investigating the impact of the rise of the vessel automation and its potential impact on seafarers and the environment, especially when it comes to safety and security. As a result, The IMO Maritime Safety Committee approved a framework and methodology for a regulatory scoping exercise and has identified four degrees of autonomy for its purpose:

- **Degree one:** Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control.
- **Degree two:** Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.
- **Degree three:** Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.
- **Degree four:** Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

10. The Central Commission for the Navigation of the Rhine (CCNR) has defined six levels of automation for inland navigation.

- **Level 0 No automation:** The full-time performance by the human boatmaster of all aspects of the dynamic navigation tasks, even when enhanced by warning or intervention systems for example, navigation with support of radar installation
- **Level 1 Steering assistance:** The context-specific performance by a steering automation system using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks for example, trackpilot (track-keeping system for inland vessels along pre- defined guiding lines)
- **Level 2 Partial automation:** The context-specific performance by a navigation automation system of both steering and propulsion using certain information about the navigational environment and with the expectation that the human boatmaster performs all remaining aspects of the dynamic navigation tasks. System performs the entire dynamic navigation tasks (when engaged)
- **Level 3 Conditional automation:** The sustained context-specific performance by a navigation automation system of all dynamic navigation tasks, including collision

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<sup>1</sup> EBA Position Statement on Coastal and Maritime Tourism, at <http://eba.eu.com/site-documents/eba-position-statements/eba-position-tourism.pdf>; and EBA Position Statement on Cruising Boat Tourism on Inland Waterways, at <http://eba.eu.com/site-documents/eba-position-statements/eba-position-inland-tourism.pdf>.

avoidance, with the expectation that the human boatmaster will be receptive to requests to intervene and to system failures and will respond appropriately

- **Level 4 High automation:** The sustained context-specific performance by a navigation automation system of all dynamic navigation tasks and fall back operation, without expecting a human boatmaster responding to a request to intervene for example, vessel operating on a canal section between two successive locks (environment well known), but the automation system is not able to manage alone the passage through the lock (requiring human intervention)
- **Level 5 Full automation:** The sustained and unconditional performance by a navigation automation system of all dynamic navigation tasks and fall back operation, without expecting a human boatmaster will respond to a request to intervene.

### Maritime regulations

11. The International Maritime Organization (IMO) sets regulatory framework for international shipping engaged on international voyages. IMO has already started to consider the regulatory arrangements for the use of Maritime Autonomous Surface Ships (MASS) based on the following legal instruments:

- International Convention for the Safety of Life at Sea (SOLAS), 1974, including the all codes that are mandatory under the Convention;
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1978 and the STCW Code;
- International Convention on Standards of Training, Certification and Watchkeeping for Fishing Vessel Personnel (STCW-F), 1995;
- Convention on the International Regulations for Preventing Collisions at Sea (COLREG), 1972;
- International Convention on Maritime Search and Rescue (SAR), 1979;
- International Convention on Tonnage Measurement of Ships (TONNAGE), 1969;
- International Convention for Safe Containers (CSC), 1972;
- International Convention on Load Lines (LL), 1966;
- Special Trade Passenger Ships Agreement (STP), 1971; and
- Protocol on Space Requirements for Special Trade Passenger Ships (SPACE STP), 1973.

12. In contrast vessels engaged in domestic voyages within the jurisdiction of one coastal state only, are not subject to the legal instruments set by IMO. Instead, such vessels and voyages are only regulated by the national regulations of the Coastal state.

13. Critically, however, the IMO Convention on the International Regulations for Preventing Collisions at Sea (COLREG) applies to all vessels.<sup>2</sup> Rights and responsibilities under the COLREG are established on the nature of the vessel not the nature of the voyage. It is not necessary to know where a vessel is going to be able to apply the COLREG. The EBA agrees that this principle remains sound with autonomous ships. Manned vessels should not be at a disadvantage or have fewer rights than unmanned ships.

14. For that reason, EBA should be concerned by any proposal to amend the COLREG to accommodate autonomous ships and it would be concerned if proposals were put forward which created corridors for autonomous ships which were prohibited to recreational craft.

<sup>2</sup> COLREG apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.

### **Inland waterways regulations**

15. CEVNI – European Code for Inland Waterways was first established in 1962, taking into account best practices from existing traffic regulations of the river commissions and UNECE member States. CEVNI Resolution No. 24 was adopted on 15 November 1985 by the UNECE, Inland Transport Committee Working Party on Inland Water Transport. This recommends that national regulations in force on inland waterways should embody the provisions contained in Resolution No. 24 and that these should be the same for all inland waterways of the country concerned. Nevertheless, in countries where CEVNI forms the basis of the national regulations, Chapter 9 permits competent authorities to omit, complement or modify the provisions of CEVNI, when this is required by the conditions of navigation. The competent authorities may also mandate additional local requirements.

16. An assessment of the regulatory challenges facing the development of autonomous shipping was presented to the UNECE Working Party on the Standardization of Technical Safety Requirements in Inland Navigation in June 2019.<sup>3</sup>

### **Differences between maritime and inland regulations**

17. A key difference between inland and maritime regulations is that under the IMO COLREG no vessel has ‘right of way’; the COLREG determine give way and stand on vessels. CEVNI Article 6.02 (2) however requires that small craft leave vessels other than small craft enough room to hold their course and to manoeuvre; they may not stand on and force larger vessels to give way. (The term “small craft” means any vessel with a hull less than 20 m long without rudder or bowsprit).

18. In summary, the maritime and inland sectors have already started to diverge on their classification of the various stages of autonomy and in the differing rules and regulations that govern them, this is bound to add further levels of complexity as the regulatory impacts are assessed and interpreted.

### **Regulatory assessment**

19. It is clear that there are already considerable differences in the differing levels of autonomy and regulation within the maritime and inland waterways sectors. For that reason the impact of autonomous shipping on each sector needs to be considered separately. The EBA believes that each regulation or rule should be analysed for every different degree of autonomy, so as to determine the best approach to address the specific autonomous shipping operation. A regulatory assessment should analyse each degree of autonomy from the following perspectives:

- **human element** (operations with or without seafarers on board (i.e. a person competent to perform the designated tasks on board and the role of a remote operator);
- **technologies** (automation of certain processes and operations to support the seafarer, remote controlled systems and operations, use of intelligent systems able to make decisions and determine actions by themselves);
- **operational procedures** (temporarily unattended or unsupervised operations, remote operations, interactions with other ships).

### **Guidelines for autonomous shipping trials**

20. It has already been stated that autonomous shipping technology is developing rapidly. As a result, there are now a number of significant trials<sup>4</sup> being conducted intended to gradually move from manned operation to fully autonomous operation. One example is the

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<sup>3</sup> [www.unece.org/fileadmin/DAM/trans/doc/2019/sc3wp3/12.\\_Ms.\\_Pauwelin\\_Ms.\\_Liegeois\\_Policy\\_areas\\_for\\_a\\_common\\_approach.pdf](http://www.unece.org/fileadmin/DAM/trans/doc/2019/sc3wp3/12._Ms._Pauwelin_Ms._Liegeois_Policy_areas_for_a_common_approach.pdf).

<sup>4</sup> For information on inland trials see: Innovation in the inland sector [www.unece.org/fileadmin/DAM/trans/doc/2019/sc3wp3/04.\\_Ms.\\_Pauwelyn\\_Innovation.pdf](http://www.unece.org/fileadmin/DAM/trans/doc/2019/sc3wp3/04._Ms._Pauwelyn_Innovation.pdf).

construction of the world's first electric autonomous containership, *Yara Birkeland*, which is expected to start autonomous operation in 2019. What is more, companies like ABB, Wartsila and Rolls-Royce have all demonstrated their pilot projects featuring remotely piloted vessels. However, as yet, no guidelines have been agreed to assist relevant authorities and stakeholders to ensure that the autonomous shipping trials are conducted safely, securely, and with due regard for other craft.

21. The risks associated with the trials should be appropriately identified and measures to reduce the risks to as low as reasonably practicable and acceptable should be put in place. Appropriate and effective emergency plans and measures should be established based on the results of the risk assessment to reduce the impact of any foreseeable incidents or failure. Furthermore, trials safety should be continuously evaluated and should be suspended or stopped where safety parameters are exceeded.

22. Above all, compliance with the intent of mandatory instruments and regulations should be ensured and reasonable steps should be taken to ensure that third parties who may be affected are informed of such trials.

### **The EBA Position on Autonomous Shipping**

23. The EBA strongly supports the fundamental principle underpinning the current steering and sailing rules set out in COLREG and CEVNI in which a vessel's rights and responsibilities are determined by the characteristics of the vessel rather than the manner in which it is crewed. The EBA believes that this fundamental principle should apply to autonomous vessels as much as it applies to fully crewed vessels.

24. The EBA will resist the 'risk' of vessels being operated autonomously being transferred to recreational boat users and with that, any requirement for recreational craft to be equipped to facilitate detection by autonomous ships.

25. The EBA believes that each regulation or rule should be analysed for every different degree of autonomy, so as to determine the best approach to address autonomous shipping operations.

26. The EBA believes that autonomous shipping trials should be conducted in a manner that provides at least the same degree of safety, security and protection of the environment as provided by the existing instruments and regulations.

### **Notes**

#### **<sup>1</sup> The European Boating Association**

The European Boating Association, Europäischer Sportschiffahrtsverband, Association Européenne de Navigation de Plaisance, is a civil, not for profit association of recreational boat users' organisations, founded in 1982, and established as an Unincorporated Association whose members agree to be governed by its constitution. The EBA member organisations (see [www.eba.eu.com/participantorgs](http://www.eba.eu.com/participantorgs)) collectively represent in excess of 1.5 million recreational boaters and an estimated 20 million active participants.

The purpose of the EBA is to represent the mutually agreed common interests of national recreational boat users' organizations in Europe, and in particular to:

- Coordinate and develop recreational boating activities in Europe by exchange of information, and action on matters of mutually agreed common interest.
- Promote the practice of all activities on the water, promoting and exchanging knowledge and experience between recreational boat users' organisations in Europe.
- Represent EBA members in environmental, regulatory and technical matters affecting their safe enjoyment of recreational boating activities on the water.
- Encourage the safe, unhampered and environmentally sustainable use of recreational boats on all European waters.

- Provide the link between the European institutions and EBA Members for consultation and information on proposed EU directives and regulations.
- Provide the link between other relevant global and regional organizations and EBA Members.

## <sup>2</sup> **Recreational Boating**

The EBA is the European representative organization for recreational boating.

There is no general consensus as to the terminology used to describe the types of boat used for “recreational boating”, with expressions such as “recreational craft” or “private pleasure craft” being used to describe only subsets of such types of boat for the purposes of specific pieces of EU legislation. “Recreational boating” also includes the use of beach- or slipway-launched water toys such as wind surfers, sailing dinghies, inflatable boats and personal watercraft.

Boats used for “recreational boating” may be small or large, propelled by sail and/or power and used on inland waters and/or at sea. “Recreational boating” at sea can range from close-to-shore to trans-oceanic.

“Recreational boating” also includes the use of such boats privately owned and operated by the owner, hired (on bareboat or skippered charter) or used to provide a service (such as training or race participation).

In the context of this document, therefore, the EBA considers “recreational boating” to mean using boats that are designed or adapted for sport or leisure, whether propelled by sail and/or power, for the purposes for which they are designed or adapted.

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