

Report 6 October 2022

MASS (automated ships) correspondence group

Background

Automated ships are already in service (as ferries within territorial limits) with various degrees of manning and safety provisions in place.

Prior to amendment of the many regulations which currently apply to ships at sea (e.g. COLREGS requiring a lookout) a MASS code of practice is being developed.

WS is a member of the correspondence group.

The draft framework for the evolving IMO MASS code of practice is at Annex.

Comment

The MASS code is in a very preliminary stage of development.

However WS has registered concerns that the safety of recreational sailors needs to be considered at all stages of development of the code of practice.

Our concerns centre on the potentially heightened risk to small vessels in close-quarters situations with other vessels that are operating under some degree of autonomy or remote control. WS would be concerned by any development within the MASS agenda that might compromise the conventional safety measures of seafarer training and competence, lookout and collision avoidance that are currently regulated under the SOLAS and STCW Conventions and the COLREGs. WS therefore intends to maintain a close watching brief on developments in the IMO's MASS work, and will seek to intervene – where possible in collaboration with Nations and/or other non-governmental organisations represented at IMO - where we sense that the safety of small vessels might be placed at increased risk.

A schedule of next steps for the correspondence group is shown below

1. Monday 10th October 2022 – deadline for comments on the attached version of the draft Code structure.
2. Thursday 13th October 2022 - a one day virtual meeting of the Group to discuss the latest version and comments on it plus any other matters including agreement on, and start of, the trial work as proposed by EC.
3. Friday 21st October 2022 – taking into account discussions during the virtual meeting on October 13th, text of proposed verbal presentation to be given to MSC 106 regarding status of the work of the CG. This to include updated draft structure of the Code.
4. November 2nd to 11th 2022 – MSC 106 including verbal presentation of status of the work of the Group and participation in the Working Group on MASS, if established.
5. November 18th 2022 – taking into account the work on MASS at MSC 106, start of next round of work of the CG.

Action required

Attend the virtual meeting on 13th October and continue to monitor developments as the MASS work evolves further.

ANNEX**DRAFT INTERNATIONAL CODE OF SAFETY FOR MARITIME AUTONOMOUS
SURFACE SHIPS (MASS CODE)****PREAMBLE**

- 1 Existing IMO instruments have historically been developed on the basis that the ship will have at least a minimum level of manning on board to carry out the various tasks required to ensure safe, secure, and environmentally sound ship operations.
- 2 The ever-increasing use of automation in the operation of ships, along with the anticipated increase in the use of remote and autonomous control, challenges, and may require changes to, the accepted norms regarding on board manual intervention and control as contained within SOLAS and other IMO Instruments.
- 3 It is recognized that some aspects associated with MASS may not be adequately or fully addressed in SOLAS or other IMO instruments and that additional guidance may be required on the design and operation of MASS to achieve a level of safety that is at least equivalent to that on what can be seen as conventional ships.
- 4 This Code has been developed to address gaps in IMO instruments in addressing MASS while ensuring that required safety levels are maintained or enhanced through the implementation of automated, remotely controlled, or autonomous functions.
- 5 The safety philosophy of this Code reflects the changes in the operational risks (increases or reductions) which may result from the introduction of autonomous or remote functions, and addresses their management and reduction through mitigation measures and controls.
- 6 This Code has been developed based on the *Generic Guidelines for Developing IMO Goal-based Standards* (MSC.1/Circ.1394/Rev.2) and the *Principles to be Considered When Drafting IMO Instruments* (resolution A.1103(29)).
- 7 This Code is intended as a supplement to other IMO Instruments, such as SOLAS, and provides a regulatory framework for the performance of autonomous or remote-controlled functions, as applicable.
- 8 This Code addresses the functions needed to obtain safe and reliable operations of MASS insofar as they are not adequately or fully addressed in other applied IMO Instruments, such as SOLAS.
- 9 The provisions of this Code should be implemented for individual autonomous functions even where persons are on board to handle other functions.
- 10 This Code takes into account that there might be a centre remote from the MASS at which some of the operational functions are conducted and addresses necessary aspects of such a remote operational centre.

PART 1 INTRODUCTION**1 Purpose**

The purpose of this Code is to provide a coherent international regulatory framework to enable and ensure safe, secure, and environmentally sound MASS operations.

The Code further aims to support the safe adoption and integration of new technology for ship operations and provide for consistency of approach to the design, build, and operation of MASS.

2 Principles

This Code is developed on the Principles that it be:

- a. supplementary to any applied base IMO Instruments, such as SOLAS, and only address MASS matters and issues insofar as they are not adequately or fully addressed in the applied base instruments;
- b. holistic to ensure that all MASS matters relevant to any applied base IMO Instruments are addressed in the Code;
- c. Function and Goal based;
- d. non-mandatory but developed in such a way as to facilitate future transition to mandatory status; and
- e. technology neutral and taking note of industrial practices and experience in the deployment of new technologies.

3 Objectives

In achieving its Purpose, this Code is intended to:

- a. ensure achievement of a level of safety at least equivalent to that of a conventional ship;
- b. enable all ships to safely coexist without impeding or negatively impacting each other, regardless of whether certain functions are remotely or autonomously performed or controlled;
- c. ensure that there is no relaxation of the level of accepted standards for design, construction or operation;
- d. allow for the application of autonomous solutions that are demonstrably safe, secure, and environmentally sound in performing their designed task in all defined conditions; and
- e. avoid the unnecessary placement of regulatory barriers to new or novel application of technology on ships.

PART 2 GENERAL

- 1 Code Structure and relationship to other IMO Instruments
- 2 Terminology and Definitions
- 3 Application
- 4 Certificate and Survey
- 5 Alternative Design
- 6 Performance Standards
- 7 Risk Assessment (tbc)

PART 3 [SPECIFIC][GENERAL] [PROVISIONS][REQUIREMENTS] FOR MASS AND AUTONOMOUS SHIP SYSTEMS

1 Systems

This section, when developed, would potentially include consideration of aspects such as Traceability, Accountability, Trust, Transparency, Reliability, Resilience, Data, Software Safety Assessment, Cyber Security, Privacy, Verifiability, Through life, Human Oversight, Connectivity.

2 Remote, Enhanced Automatic, and Autonomous Operation

- 2.1 Remote Operations
- 2.2 Communications
- 2.3 Human-Machine Interface, including alarms
- 2.4 xxxx
- 2.5 xxxx

3 Human Element

- 3.1 Roles and Responsibilities
- 3.2 Training and Manning

PART 4 GENERAL SAFETY [PROVISIONS] [REQUIREMENTS]

- 1 Navigation and Collision Avoidance
- 2 Telecommunications
- 3 Stability and Watertight Integrity
- 4 Fire Protection
- 5 Life Saving
- 6 Maintenance, Inspection/Testing and Repair
- 7 Management of Safe Operations
- 8 Security
- 9 Structural Integrity
- 10 Search and Rescue
- 11 Cargo Handling
- 12 Personnel Safety and Comfort

ANNEX

1 MASS TRIALS