

IMO Regulations - MASS



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Agenda

- Disclaimer
- Introduction BSH
- Draft MASS Code
 - Development/History
 - Current Road Map
 - Structure of the MASS Code
 - Report MSC 109
 - Software and AI

MARITIME SAFETY COMMITTEE
109th session
Agenda item 5

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As at its date of issue, this document, in whole or in part, is subject to consideration by the IMO organ to which it has been submitted. Accordingly, its contents are subject to approval and amendment of a substantive and drafting nature, which may be agreed after that date.

**DEVELOPMENT OF A GOAL-BASED INSTRUMENT FOR
MARITIME AUTONOMOUS SURFACE SHIPS (MASS)**

Report of the Working Group

German Federal Maritime and Hydrographic Agency (BSH)

- Higher federal agency under the Federal Ministry for Digital and Transport
- Participation in more than 170 different committees and more than 10 international organizations
 - IMO - International Maritime Organization
 - IHO - International Hydrographic Organization
 - ITU - International Telecommunication Union
 - ...

Maritime Autonomous Surface Ship

Maritime Autonomous Surface Ship (MASS) means a ship which, to a varying degree, can operate independent of human interaction.

Development of the MASS Code

- MSC 98 (2017) Proposal to undertake a Regulatory Scoping Exercise (RSE) on MASS
 - Assessment of existing IMO instruments under the remit of the MSC
 - SOLAS, COLREG, STCW, ISM, ISPS, SAR, ...
 - Target completion year 2020
- MSC.1/Circ.1604 (2019) Interim Guidelines for MASS
- MSC.1/Circ.1638 (2021) Outcome of the RSE
- MSC 103 (2021) Development of a goal based instrument
 - Intended as supplementary to other IMO instruments
 - Developed by WG, ISWG, CG, JWG

MSC Maritime Safety Committee
WG Working Group
ISWG Intersessional Working Group
CD Correspondence Group
JWG Joint Working Group

Revised Road Map

MSC 110 (June 2025)

- Consideration of the outcome of the MASS CG
- Further develop the non-mandatory MASS Code

MASS ISWG 4 (2nd half 2025)

- Further develop the non-mandatory MASS Code

MSC 111 (May 2026)

- Consideration of the outcome of MASS ISWG 4
- **Finalization and adoption** of the non-mandatory MASS Code
- Invite relevant sub-committees to review the non-mandatory Code

Revised Road Map

MSC 112 (December 2026)

- Develop a framework for an Experience Building Phase (EBP) post adoption of the non-mandatory MASS Code

MSC 1XX

- Commence development of the mandatory MASS Code

MSC 1XX

- Adoption of the mandatory Code (latest 1st July 2030 for entry into force on 1st January 2032)

Structure of the MASS Code (Draft)

- Preamble
- Part 1: Introduction
- Part 2: Main Principles for MASS and MASS Functions and Remote Operations
- Part 3: Goals, Functional Requirements and Expected Performance

Part 1: Introduction (Draft)

- Chapter 1 Purpose, Principles and Objectives
 - 1.1 Purpose
 - 1.2 Principles
 - 1.3 Objectives
- Chapter 2 Application
- Chapter 3 Code Structure
- Chapter 4 Terminology and Definitions

Application

Applies to cargo ships to which SOLAS chapter I applies

- I/1(a) Unless expressly provided otherwise, the present regulations apply only to ships engaged on international voyages
- I/2(g) A *cargo ship* is any ship which is not a passenger ship
- I/3(a) The present regulations, unless expressly provided otherwise, do not apply to:
 - (ii) Cargo ships of less than 500 gross tonnage

Terminology

- **Concept of Operation** (ConOps) means a document describing the characteristics of a proposed system.
- **Modes of Operation** means the condition(s) under which the functions of a MASS are controlled.
- **Operational Envelope (OE)** provide ship's operational capabilities and limitations and ship-specific capabilities and limitations.
- **Operational Design Domain (ODD)** means a document providing the conditions, related control modes and modes of operation under which any individual autonomous or remote operated ship function is designed to operate

Part 2: Main Principles ... (Draft)

Technical principles **applicable in all cases** when applying this Code to autonomous or remotely operated functions. These principles and requirements should be met as part of any approval and certification process.

e.g.

- Chapter 6 Approval Process
- Chapter 7 Risk Assessment

Part 3: Goals, FR and EP (Draft)

Goals, functional requirements, and provisions applicable to autonomous or remotely operated functions. Depending on the mode of operation and functionality being certified.

e.g. Chapter 17 Safety of Navigation

- The **goal** of this chapter is to provide for safe navigation
- An ANS or system for remote navigation should maintain adequate situational awareness for the purpose of ensuring safe navigation (FR17.4.3 Situational awareness)
- An ANS or system for remote navigation should continuously monitor all information necessary for safe navigation, based on the OE (EP1)

MSC 109 Report of the MASS WG

Consideration of Part 2

- Group finalized and agreed to Chapter 7 Risk Assessment
- Group finalized and agreed to Chapter 12 Connectivity

Consideration of Part 3

- Group finalized and agreed to Chapter 18 Remote Operations

Group was not able to consider chapters:

- 6, 9, 10, 11, 13, 16, 19, 21, 22, 24, 25, 26, 27

Software and AI

- AI is not explicitly addressed in the Draft
- May refer to Software
- Chapter 10 Software Principles
 - Reliability
 - Safety and Security
 - Transparency and Explainability
 - Robustness

Example for National Regulations

UK

- Work Boat Code Edition 3
- MGN 664 Amendment 1: Certification process for vessels using innovative technology
- MIN 698 Amendment 1: Workboat Code Edition 3 – standards and guidelines for best practice
- MGN 702 MASS of Less than 2.5 Metres in Length Overall
- MGN 705 Remotely operated unmanned vessels (ROUVs) of 2.5 metres to less than 4.5 metres in length overall

Vielen Dank für Ihre Aufmerksamkeit

Thank you for your attention

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