

**MARINE SAFETY AND SECURITY MANAGEMENT SYSTEM****TIER I – POLICY****INSTALLATION AND OPERATION OF AUTONOMOUS  
NAVIGATION SYSTEMS ON BOARD VESSELS**

Effective Date	Date of Revision

## MARINE SAFETY AND SECURITY MANAGEMENT SYSTEM

### TIER I - POLICY

#### INSTALLATION AND OPERATION OF AUTONOMOUS NAVIGATION SYSTEMS ON BOARD VESSELS

##### 1. Policy Objective

- 1.1 Provide guidance to Authorized Representatives (AR) on the installation and operation of autonomous navigation system requirements onboard Canadian registered vessels.
- 1.2 Provide additional information on restrictions/exemptions under the *Canada Shipping Act (CSA), 2001*, (the Act) for installing and operating equipment outside the scope of the regulatory regime.

##### 2. Policy Statement

- 2.1 Installation and operation of the autonomous navigation system in addition to the equipment carriage or the operational requirements are to be in compliance with the guidance in Annex 1 and provide at least the same degree of safety, security, and protection of the environment as the applicable regulations.
- 2.2 Regional TC MSS must be advised by the AR prior to fitting autonomous functions/systems to overview the process and agree on the reporting details.
- 2.3 AR to report and shall maintain record-keeping concerning the autonomous system performance (i.e., override done by Master, safety parameters exceeded, technical issues encountered, etc.) according to item 1.4 from the guidance in Annex 1.

##### 3. Scope

- 3.1 This policy applies to ARs that intend to fit onboard Canadian vessel(s) with autonomous navigation systems that do not impede compliance with the *CSA, 2001*.

#### **4. Authority**

- 4.1 This policy is authorized by the Marine Safety and Security Executive and is in accordance with the objectives of the CSA, 2001.

#### **5. Responsibility**

- 5.1 The Director General, Marine Safety and Security is accountable for the implementation of this policy.
- 5.2 The Executive Director, Navigation Safety and Environmental Programs is the functional authority for the development, implementation, maintenance, and continuous improvement of this policy.
- 5.3 The Regional Directors are responsible for the implementation and promotion of this policy in their respective regions.
- 5.4 Comments or queries related to this policy and its application should be addressed to:  
Manager, Navigation Safety and Radiocommunications  
330 Sparks Street, Ottawa ON K1A 0N8  
[tc.navradio.tc@tc.gc.ca](mailto:tc.navradio.tc@tc.gc.ca).

#### **6. Related Documents**

- 6.1 IMO MSC.1/Circ.1604 Interim Guidelines for MASS Trials.
- 6.2 *Canada Shipping Act, 2001*, <https://laws-lois.justice.gc.ca/eng/acts/c-10.15/>

#### **7. Background**

- 7.1 ARs are seeking to incorporate autonomous systems on their vessels to enhance the efficiency of operations.
- 7.2 TCMSS recognizes that the autonomous system is an emerging technological stream and is actively engaging in the development of this new field considering navigation safety, the security and safety of all waterway users, and the protection of the environment.
- 7.3 The MSC.1/Circ.1604 for MASS Trials, published by the International Maritime Organization (IMO) is meant for any degree (1 to 4) of autonomous vessels which are not reflected in the current regulatory regime under the CSA,2001. Transport Canada Marine Safety and Security (TCMSS) considered and included the principles and objectives of the international guidelines which are in line with the scope of the policy in Annex 1.

## 8. Definitions

- 8.1 Authorized Representative (AR) has the same meaning as section 2 of the CSA 2001.
- 8.2 Autonomous navigation system – meaning a system including functions onboard a vessel which, to a varying degree, can perform autonomous manoeuvres or navigational activities with human oversight.

## 9. Date of Application

- 9.1 This policy comes into effect on June 23, 2023.

## 10. Date for Review or Expiry

- 10.1 This policy shall be in effect until rescinded, or until Regulations supersede.

## 11. RDIMS Reference

- 11.1 La version française du présent document est dans le SGDDI et porte le numéro de référence # 19464333.
- 11.2 This is the first approved and finalized revision of the English version of this document.

## 12. Keywords

- Autonomous
- Risk assessment
- International Maritime Organization
- MSC.1/Circ.1604
- MASS Trials
- *Canada Shipping Act, 2001*
- Authorized Representatives

## ANNEX I

### **Guidance to be followed prior to the installation and during the operation of autonomous navigation systems.**

Installation and operation of autonomous functions and systems in addition to the equipment or operational requirements shall be complied with to provide at least the same degree of safety, security, and protection of the environment as the required regulations.

The following guidelines are intended to be used by Authorized Representatives (ARs) when planning, installing, or retrofitting autonomous systems.

#### **1. Risk Management**

- 1.1 The risks associated with the use of such autonomous functions systems should be appropriately identified and measures to reduce the risks to as low as reasonably practicable and acceptable should be put in place.
- 1.2 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.
- 1.3 Safety should be continuously evaluated and the use of such autonomous functions or systems should be suspended or stopped where safety parameters are exceeded.
- 1.4 Record-Keeping must be kept by the AR concerning the system performance (i.e., override done by the Master or its representative, safety

parameters exceeded, technical issues encountered, etc.) and it should be made available upon request to the TCMSS - MSI. Record-keeping is to be submitted on a yearly basis to the regional TCMSS technical service for awareness.

## 2. Compliance with mandatory instruments

- 2.1 Compliance with the existing regulatory regime should be ensured (e.g., CSA, 2001, Navigation Safety Regulations, 2020, and Electromagnetic compatibility IEC standards 60945 and 60533).
- 2.2 Application for a Marine Technical Review Board (MTRB) decision must be made, and approval obtained where an autonomous function or system would interfere in such a way that compliance with the regulatory regime would not be met. (Equipment carriage/Standards, Safe Manning).
- 2.3 Written confirmation from AR (through the RO) is required stating that the new installation will not alter the required onboard equipment against its corresponding standard or operational requirements.

## 3. Manning and qualifications of personnel

- 3.1 Minimum manning requirements are required to be met including certification for all modes of operation.
- 3.2 Onboard operators involved in the autonomous functions should be appropriately qualified, trained for operating such systems and they are to adhere to manufacturer operation guidance.

## 4. Human Element Principles, and Goals *(including monitoring infrastructure and human-system interface)* \* see IMO Res A.947(23)

- 4.1 For the safe, secure, and environmentally sound use of autonomous systems, the human element should be appropriately addressed. The human-system interface is the harmonization between human-centered design and automation are key components of autonomous function.
- 4.2 Procedures should be in place to operate and monitor the autonomous

functions.

## **5. Infrastructure for safe use of the autonomous system**

- 5.1 In line with risk management, appropriate strategies should be implemented to mitigate the effects of incidents and/or failure of autonomous functions/systems, technology, and testing. These strategies should include the ability to respond to emergencies.
- 5.2 Autonomous system should be fitted with a manual override that can be activated by the operator at any given time or in case of malfunctions during the system operation. The override would allow a complete bypass of the autonomous system.
- 5.3 Information related to the ship's performance and the basis of judgment by autonomous systems should be available to any person involved in its use.

## **6. Cyber risk management**

- 6.1 Appropriate steps should be taken to ensure sufficient cyber risk management of the systems and infrastructure used.