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REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS)

Proposed terminology for MASS

Submitted by ISO

SUMMARY

Executive summary:	This document contains a report on the work undertaken by ISO TC8 to develop an internationally agreed terminology for MASS. The document also contains the currently proposed terminology.
Strategic direction, if applicable:	2
Output:	2.7
Action to be taken:	Paragraph 8
Related document:	MSC 101/24

1 At MSC 101 it was requested of ISO to provide a report on its standardization work related to a terminology for Maritime Autonomous Surface Ships (MASS). This document is provided as a response to that request.

2 ISO Technical Committee 8 has had two physical meetings as well as an extensive mail correspondence going on from March to November 2019 to develop a first version of the proposed terminology, which is included in this document.

3 This terminology is still in working group stage and has not yet been distributed for international commenting among ISO TC8's members.

4 The further work on the proposed ISO standard will await any comments that the Maritime Safety Committee may provide.

5 After updates and commenting from the international community, the plan is to publish the terminology as a technical specification, which is similar to a proper international standard, but with a three-year validity before it needs to be cancelled, reconfirmed, updated or turned into an international standard. This is done to reflect the relatively immaturity of the area while also proving a basic terminology while the technology and operative environment develops.

6 The proposed terminology presented in the annex to this document will be the core normative part of the technical specification.

7 In addition, the technical specification will have several informative annexes that provide suggestions for more technical terminology.

Action requested of the Committee

8 The Committee is invited to comment on the proposed terminology as appropriate.

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ANNEX

PROPOSED GENERAL MASS TERMINOLOGY

Automatic

Pertaining to a process or device that, under specified conditions, can function without human intervention (definition is based on ISO/TR 11065).

Note 1 to entry: In this standard, automatic is used in the meaning that a system gives a programmed, learned or other designed response to a range of inputs in relevant system states.

Note 2 to entry: In ISO/TR 11065 the term process is defined as "a course of events defined by its purpose or by its effect, achieved under given conditions." For a specific ship, its processes will depend on the type of ship and its mission. Some possible processes are energy production, stability, propulsion and steering, anti-collision etc.

Automation

The implementation of processes by automatic means (ISO/TR 11065).

Autonomous – Autonomy

In the context of ships, autonomy e.g. as in "Autonomous Ship", means that the ship uses automation to operate without human intervention, related to one or more ship processes, for the full duration or in limited periods of the ship's operations or voyage.

Note 1 to entry: This definition requires that the operation can be performed without human intervention during the specified time period. This differentiates autonomous functions from conventional automation by requiring that automation that facilitates autonomous operation must be designed and verified to allow it to be unattended during the whole of the relevant time period. The period can vary from minutes if the human is available, but doing something else, via 10s of minutes, if the human is sleeping and must be mustered, up to the full duration of the voyage. This applies equally to operators on shore or onboard.

Note 2 to entry: This definition qualifies the term autonomous by giving it a temporal as well as process dimension. It may also be necessary to differentiate on the abstraction level of the process, e.g. *functional* (e.g. keep course and speed), *goal based* (e.g. reach a target position with appropriate speed and heading) or *planning*. An autopilot is on the functional level and could be said to enable autonomous operation as it allows the crew to do other tasks than active steering during transit in open waters. On a goal-based or planning level, such a limited process description does not make sense. The terms "fully autonomous" or "autonomous" should be avoided unless sufficiently qualified with respect to what operations, duration and level of operation they refer to.

Note 3 to entry: This definition allows an operator to monitor the execution of an autonomous process as long as it is not expected that the operator may need to intervene. As an example, a dynamic positioning system, although highly automated, should not be called autonomous as it is expected that a qualified operator always is present and ready to intervene on short notice.

Note 4 to entry: One may also envisage an autonomous monitoring and control function that supervises an operator and overrides the operator's action when these actions are deemed dangerous. However, this may better be called an emergency override rather than an autonomous process. Such a function would also have important safety implications as it could remove the "last resort" intervention possibility from the human operator. Thus, it should be designed on a case-by-case basis, based on a sufficiently thorough risk assessment including a Human Reliability Analysis.

Autonomous ship system

All physical and human elements that together ensure effective monitoring and control of the autonomous ship processes in the ship's intended operation or voyage.

Note 1 to entry: In general, an autonomous ship may depend on several other systems on shore, in port or being accessible in the fairways that enables the automation to monitor and control the processes that need to be performed without human intervention. As an example, an autonomous ship system commonly includes an RCC and one or more wireless communication services. In this standard, this system will be described as the "autonomous ship system". If the reference is made to the ship itself, the term "autonomous ship" or just "ship" may be used.

Remote Control Centre – RCC

An RCC is a site or device remote from the ship from which monitoring and/or control of some or all of the ship processes can be executed.

Note 1 to entry: An RCC may consist of more than one control room that may be located at different physical locations. See ISO 11064-3 for a more extensive set of terminology for control rooms and centres.

Note 2 to entry: The term "control" does not preclude that some or all processes are only monitored and/or are autonomous.

Note 3 to entry: Control may include providing a set of instructions that can be executed in predefined future situations.

Shore Control Centre – SCC

An RCC that is located on land.

Note 1 to entry: RCC is the preferred generic term. As it is in common use in the industry, SCC is included as alternative when the RCC is located on land.

Unattended

Used for a process control position or the process itself, e.g. an "unattended engine control room" or "unattended engine control", when no personnel are attending to the specific process or the corresponding control position.

Note 1 to entry: "Periodically unattended" can be used when personnel are nearby, but for a period are not attending. "Permanently unattended" can be used when the processes or control position do not need attention at all.

Crewless ship

A ship with no crew on board.

Note 1 to entry: Crew does not include passengers, special personnel etc.

References

ISO/TR 11065:1992 Industrial automation glossary.

ISO 11064-3 Ergonomic design of control centres -- Part 3: Control room layout.