Guidance Of Bridge Watchkeeping Arrangement on MASS degree 2

TEAM - MASSODOLOGY

CONTRACTOR OF THE OF

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01 Background 02 Problem 03 Solution 04 Conclusion











TABLE 2 - LIST OF OUPUTS FOR THE 2022-2023 BIENNIUM

Reference to SD, if applicable	Output number	Description	Target completion year	Parent organ(s)	Associated organ(s)	Coordinating organ(s)
SD 2 Integrate new and	2.6	Finalization of second-generation intact stability criteria	2022	MSC	SDC	
advancing technologies in the regulatory	2.7	Regulatory scoping exercise for the use of maritime autonomous surface ships (MASS)	2022	FAL		
framework	2.8	Development of guidelines for cold ironing of ships and consideration of amendments to SOLAS chapters II-1 and II-2	2022	MSC	III/HTW/SDC	SSE
	2.9 (New)	Development of amendments to VDR	2023	MSC	NCSR	

SD = IMPORTANT ISSUES

Reference : A 32-9(a) - (a) Strategy and planningRevised Strategic Plan for the Organization for the six-year periperiod 2018 to 2023 Note by the Secretary-General



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04

C/ES.34/3(a) Annex, page 11



INTERNATIONAL MARITIME ORGANIZATION

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

The Maritime Safety Committee, at its 103rd session (5 to 14 May 2021), approved the Outcome of the regulatory Scoping Exercise for the use of Maritime Autonomous Surface Ships (MASS), as set out in the annex, which provides the assessment of the degree to which

Reference : MSC.1-Circ.1638 - Outcome Of The Regulatory Scoping ExerciseFor The Use Of Maritime Autonomous Surface Ships(MASS)



Ε

MSC.1/Circ.1638 3 June 2021



< Autonomy Degrees >

Degree1	Ship with automated processes and decision support: Seafarers Are On Board To Opera functions. Some operations may be automated and at til ready to take control.
Degree2	Remotely Controlled Ship With Seaf The ship is controlled and operated from another locatio and to operate the shipboard systems and functions
Degree3	Remotely Controlled Ship Without S The ship is controlled and operated from another location.
Degree4	Fully Autonomous Ship : The operating system of the ship is able to make decisions

Reference : IMO document MSC 100/WP.8 "REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS)"



te And Control shipboard systems and imes be unsupervised but with seafarers on board

farers On Board:

n. Seafarers are available on board to take control

Seafarers On Board:

There are no seafarers on board.

and determine actions by itself.

06 29

< Definitions >

"Remote operator"

"A person with the required qualifications who performs or monitors the navigation of one or more autonomous ships without being on board the ship in person and who is entitled to represent the ship vis-à-vis the authorities."

"Autonomous ships"

"<u>Ships capable of providing</u> – via automatic processes – <u>decision-support</u> or a possibility of taking over parts of or the entire human control and management of the ship, irrespective of whether the control is exerted from the ship or from somewhere else."

Reference : IMO document MSC 100/WP.8 "REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS)"







Reference : IMO homepage - Hot topics - Autonomous ship



< Regulatory Development Of MASS >

Started to develop a framework for the RSE the preliminary definition of MASS	MSC 99 ('18. MAY)
Approved the framewo which contained definitions, a methodology and a plan of work an	MSC 100 ('18. DEC)
Owing to the COVID-1 MSC 102 deferred consideration o	MSC 102 ('20. NOV)
Finalized the RSE and appr	MSC 103 ('21. MAY)
Approved a road map containing a work instruments for	MSC 105 ('22. APR)

Reference : MSC.1/Circ.1638 OUTCOME OF THE REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS) MSC 105/WP.8 DEVELOPMENT OF A GOAL-BASED INSTRUMENT FOR MARITIME AUTONOMOUS SURFACE SHIPS (MASS)



and defined the aim, the objective, and degrees of autonomy.

rk for the RSE, consisting of a two-step approach d procedures

19 pandemic, of this matter to MSC 103.

oved the outcome.

plan for the development of IMO MASS



< Road Map Of MASS CODE >



Reference : MSC 105/WP.8 DEVELOPMENT OF A GOAL-BASED INSTRUMENT FOR MARITIME AUTONOMOUS SURFACE SHIPS (MASS)





< IMO Seminar on Development of a Regulatory Framework for MASS >





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02

Problem





Problem 02

Title

STCW Convention & Codes / STCW Code Part A / Part 3

PART 3 - WATCHKEEPING AT SEA

PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

12 The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972.

Look-out

13 A proper look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972 and shall serve the purpose of:

Reference : STCW Convention & Codes / STCW Code Part A / Part 3







Who Is The O.O.W?





OFFICER ON BOARD

PHOTO: https://www.mosaicfloridaphosphate.com/nextgen-remote-operations-automation-bridging-the-distance/, https://www.istockphoto.com/photos/ship-captain



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4



REMOTE OPERATOR

Problem 02

Section A-VIII/2

Watchkeeping arrangements and principles to be observed



PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH



16 In determining that the composition of the navigational watch is adequate to ensure that a proper look-out can continuously be maintained, the master shall take into account all relevant factors, including those described in this section of the Code, as well as the following factors:

.1 visibility, state of weather and sea;

- .2 traffic density, and other activities occurring in the area in which the vessel is navigating;
- .3 the attention necessary when navigating in or near traffic separation schemes or other routeing measures;



Reference : STCW code Section A, chapter VIII/2 PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH 16







02 Problem

Watch Keeping Level	Level A	Level B	
Vessel Operators			
Risk level	Risk	Risk	







03

Solution





Watch Keeping Level	Level A	Level B	Level C	Level E
Vessel Operators	Remote Operator(OOW)	Officer(OOW)& Remote Operator	Master (conning VSL)& Officer(OOW)& Remote operator	Master (conning VSL)& Officer(00W)
Conditions	Clear weather / Low traffic density	Heavy weather / High traffic density / Restricted visibility	Narrow channel / Traffic separation schemes / Entering & Leaving port(POB) / Any case of necessity by Master's decision.	Emergency Situations: Autonomous & Remotely controlled system fails

Guideline of Watchkeeping Level in Degree 2 - 또 The Mock IMO Assembly





Level A

Remote Operator(OOW)

Clear weather/ Low traffic density



< Clear weather & Low traffic density >

Guideline of Watchkeeping Level in Degree 2





Level B

Officer(00W)& Remote Operator

Heavy weather/ High traffic density/ Restricted visibility

< High traffic density >





< Restricted visibility >



Guideline of Watchkeeping Level in Degree 2

Level C

Master (conning VSL)& Officer(OOW)& Remote operator

Narrow channel/ Traffic separation schemes/ Entering & Leaving port(POB)/ Any case of necessity by Master's decision.



< Narrow channel >





Guideline of Watchkeeping Level in Degree 2

Level C

Master (conning VSL)& Officer(00W)& Remote operator

Narrow channel/ Traffic separation schemes/ Entering & Leaving port(POB)/ Any case of necessity by Master's decision.



< Traffic separation schemes >

Photos : http://www.incheonpilot.com/port/port03.asp, https://knowledgeofsea.com/wp-content/uploads/2020/01/277.png





Guideline of Watchkeeping Level in Degree 2

Level C

Master (conning VSL)& Officer(00W)& Remote operator

Narrow channel/ Traffic separation schemes/ **Entering & Leaving** port(POB)/ Any case of necessity by Master's decision.



Photos : http://www.incheonpilot.com/port/port03.asp, https://knowledgeofsea.com/wp-content/uploads/2020/01/277.png https://www.offshore-energy.biz/panama-canal-wins-arbitration-case-against-gupc-consortium



< Entering & Leaving port (POB) >



Level E

Master (conning VSL)& Officer(00W)

Emergency Situations: Autonomous & Remotely controlled system fails





Communication ship to remote control

Guideline of Watchkeeping Level in Degree 2 - 🐼 무의







Guideline of Watchkeeping Level in Degree 2

Level E

Master (conning VSL)& Officer(00W)

Emergency Situations: Autonomous & Remotely controlled system fails









Conclusion





04 Conclusion



More than 80% of maritime accidents are due to human error

Improve safety

Reducing human error
Possibility of insurance discount



Increasing lack of experienced seafarer

Assist seafarer

Assisting with algorithms that incorporate experienced captain's know-how

Reference : IMO Seminar on Development of a Regulatory Framework for MASS - Hyogyeong Joo, Avikus - MASS Technology Development Status





New environmental regulations and increased competition drives down margins

Reduce OPEX

Increasing fuel efficiencyReducing GHG emission



Reference

Reference : A 32-9(a) - (a) Strategy and planningRevised Strategic Plan for the Organization for the six-year periperiod 2018 to 2023 Note by the Secretary-General

Reference : MSC.1-Circ.1638 - Outcome Of The Regulatory Scoping ExerciseFor The Use Of Maritime Autonomous Surface Ships(MASS)

Reference : IMO document MSC 100/WP.8 "REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS)"

Reference : IMO homepage - Hot topics - Autonomous ship

Reference : MSC.1/Circ.1638 OUTCOME OF THE REGULATORY SCOPING EXERCISE FOR THE USE OF MARITIME AUTONOMOUS SURFACE SHIPS (MASS)

Reference : MSC 105/WP.8 DEVELOPMENT OF A GOAL-BASED INSTRUMENT FOR MARITIME AUTONOMOUS SURFACE SHIPS (MASS)

Reference : Youtube - IMO Resources and Webinars - Day 1part 1 Seminar on Development of a Regulatory Framework for Maritime Autonomous Surface Ships

Reference : STCW Convention & Codes / STCW Code Part A / Part 3

Reference : STCW code Section A, chapter VIII/2 PART 3-1 - PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH 16





Thank you for your attention



