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WORK PROGRAMME

Proposal for a new output to facilitate a regulatory framework to support the safe delivery of IMO's strategy on reduction of GHG emissions from ships

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SUMMARY

Executive summary: This document proposes a new output to undertake a regulatory assessment of safety aspects associated with reducing GHG emissions from ships in line with the Organization's strategy (MEPC.304(72), as revised) and to develop a road map to support the safe delivery of IMO's Strategy.

Strategic direction, if applicable: 2 and 3

Output: Not applicable

Action to be taken: Paragraph 39

Related documents: A 32/12/2; MSC 105/2/2, MSC 105/20 (paragraph 14.11); CCC 8/2/1, CCC 8/18 (paragraph 3.19) and MSC 106/19 (paragraph 16.40)

Introduction

1 This document is submitted in accordance with the provisions of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.4) on the submission of proposals for new outputs and proposes a way to organize the work of the Committee in order to assess the impacts on safety of shipping from deployment of fuels and technologies on ships to achieve compliance with environmental regulations being developed by IMO as per the *Initial IMO strategy on reduction of GHG emissions from ships* (MEPC.304(72), as may be revised), and determine the extent of the need to amend the regulatory framework to enable the safe, secure, environmentally sound and effective response to climate change by international shipping.

Background

2 Having noted the overwhelming support for documents A 32/12/2, MSC 105/2/2 and CCC 8/2/1, CCC 8 recognized the wide variety and complexity of the matter on the development of safety requirements for alternate fuels and the technologies it may involve, in particular that the work may not necessarily be confined to the context of the IGF Code.

3 Further, MSC 106 noted the deliberations of CCC 8, in particular its invitation to interested Member States and international organizations to liaise with IACS with a view to submitting a proposal to MSC 107 for a new output on a holistic approach for the development of safety requirements at the needed pace to support the achievement of the Organization's decarbonization goal (MSC 106/19 paragraph 16.40).

4 This document responds to the above and offers the analysis against the assessment criteria as contained in paragraph 4.15 of MSC-MEPC.1/Circ.5/Rev.4.

The proposal is within the scope of the mission of IMO

5 The mission of IMO, as a United Nations specialized agency, is to promote safe, secure, environmentally sound, efficient and sustainable shipping through cooperation. This will be accomplished by adopting the highest practicable standards of maritime safety and security, efficiency of navigation and prevention and control of pollution from ships, as well as through consideration of the related legal matters and effective implementation of IMO instruments, with a view to their universal and uniform application.

6 The use of novel technologies or adaptation of existing technologies to combust fuels other than fossil-based fuel oil carries a safety risk due to either complete lack of application of those technologies and fuels in a marine context or very little experience mostly originating from first movers in the industry. Further, lack of internationally accepted safety regulations could create inefficiencies due to potential issues with port State control when ships designed and built to use such technologies/fuels call at foreign ports of a Member State that has not yet established regulations to accommodate such technologies/ fuels.

7 Safety risks also have the potential to expand into marine environment pollution scenarios (such as fuel spills etc).

8 The above considerations undoubtedly fall within the scope of the mission of the Organization.

9 The proposed regulatory assessment would allow IMO to respond proactively to the growth in the use of alternatives to fossil-based fuel oil and provide confidence to the industry to invest in these fuels and technologies with certainty of the safety framework (SOLAS etc) keeping pace with the environmental framework (MARPOL etc).

The exercise of functions conferred upon a Committee by or under any international convention or related instrument

10 Article 28(a) of the Convention on the International Maritime Organization states:

"(a) The Maritime Safety Committee shall consider any matter within the scope of the Organization concerned with aids to navigation, construction and equipment of vessels, manning from a safety standpoint, rules for the prevention of collisions, handling of dangerous cargoes, maritime safety procedures and requirements, hydrographic information, log-books and navigational records, marine casualty investigation, salvage and rescue, and any other matters directly affecting maritime safety."

11 Article VIII(ii) of the International Convention for the Safety of Life at Sea, 1974, states:

"(ii) Any amendment proposed and circulated as above shall be referred to the Maritime Safety Committee of the Organization for consideration".

12 From the above, it is clear that the consideration of any safety aspects of technologies and fuels used on board ships falls within the purview of the Committee.

The need and justification for the output

13 IMO's initial strategy on the reduction of GHG emissions from ships has set a target that requires proactive action from industry to reduce GHG emissions from ships. To demonstrate its social responsibility and to prepare for further environmental regulations being developed by MEPC, the maritime sector is witnessing the first pilot projects either using alternative fuels, adapting existing technologies, or installing new technological solutions. To assist with meeting the immediate needs, in the recent past, the focus of IMO has been on LNG as fuel within the IGF Code, whilst also looking at other alternatives. Interim guidelines were developed for fuel cells, amongst others. CCC has also started work on ammonia and hydrogen. This output would not prevent CCC continuing to progress that work.

14 It is understood that the considerations within the IMO initial strategy on the reduction of GHG emissions from ships and the discussion related to a revised strategy assume (however do not directly address) the existence and scalability of alternative fuels and technologies which are needed to deliver and operate a significant number of zero GHG-emitting ships 'on the water' by 2030. The successful delivery of an ambitious and accelerated GHG reduction policy will have to go 'hand in hand' with the assessment of safety risks to ships, the people operating on board, and the surrounding infrastructure and personnel, and the delivery of the necessary accompanying international safety regulations to ensure these regulations do not cause a barrier to the deployment of the necessary technologies and fuels.

15 As the shipping industry starts to respond to the expected measures, the co-sponsors note the following newbuilding orders (with options) already placed/expression of interests (information is supplied by IACS members):

Technology/fuel	Total number of ships ¹	Ship type(s) ²
Methanol	72	Chemical Tanker, Bulk Carrier, Gas Carrier, Containership, Passenger Ship, Oil Tanker, General Cargo Ship, Dredger
Ammonia	68	Bulk Carrier, Tug, Gas Carrier, Containership, Tanker (crude, product and gas)
Methanol and Ammonia Ready	32	Containership, LPG Carrier, Pure car Truck Carrier
Hydrogen	11	Tug, Bulk Carrier, Oil Tanker, Liquefied Hydrogen Carrier, Cruise Ship, Miscellaneous
Fuel Cell	9	Car Carrier, Dredger, Passenger Ship, Cruise ship
Batteries	111	Oil Tanker, Ro-Ro Passenger Ship, General Cargo ship, Dry bulker, Others

¹ SOLAS ships only.

² Can be multiple (for both tables).

Technology/fuel	Total number of ships ¹	Ship type(s) ²
Wind	14	Bulk Carrier, General Cargo Ship, Ro-Ro Cargo ship
Biofuel Capable	5	Miscellaneous, Oil Tanker
Total	322	

16 Approval in Principle has been issued for the following fuel/technology projects (information is supplied by IACS members):

Technology/fuel	Total number of designs	Ship type(s)
Methanol	13	Chemical Tanker, Oil Tanker, Containership, Bulk carrier, Hopper Dredger
Ammonia	28	Car Carrier, Bulk Carrier, Tug, Gas Carrier, Containership, NH3 carrier
Ammonia Ready	12	Gas Carrier, Bulk Carrier, Oil Tanker
Hydrogen	13	Liquefied Hydrogen Carrier
Hydrogen Ready	6	Applicable to all Ship types
Fuel Cell	19	Applicable to all Ship types
Batteries	31	Applicable to all Ship types
Wind	19	Bulk Carrier, Containership
CCS	12	Applicable to all Ship types
Total	153	

17 The global newbuilding capacity to deliver ocean going ships is assessed at around 1,500 ships³ per year. This capacity will have to include zero-GHG-emitting ships to which approved new or adapted equipment or alternative fuels will need to be delivered for installation or consumption.

18 The timescale for the reduction of GHG from ships means there is a commensurate urgency to understand associated safety risks and to establish an effective assurance arrangement for the safety of the necessary solutions.

19 In addressing this challenge, the co-sponsors consider that the Committee should look at a coherent and focused 'safety' approach to identifying the most efficient route for the delivery of actions necessary to achieve the set goal(s) and consider:

- .1 the different safety risks associated with the delivery of zero GHG-emitting ships along the lifecycle within the shipping industry (e.g., technology development, development of requirements, assessment of technology and their integration on ships, scalability of technology to match newbuilding capacity against the goal, performance of shipboard systems in operation, and finally the survey requirements of ships and their systems); and
- .2 the certainty and clarity of regulations applicable to technical solutions and the necessity for common standards to 'assure confidence' of the proposed technology, approve the final product and expedite implementation at an affordable cost.

¹ SOLAS ships only.

² Can be multiple (for both tables).

³ Data source: Active Shipbuilding Experts' Federation (ASEF).

20 It is the co-sponsors' intention that this proposal will help IMO understand the full range of safety regulatory implications arising from new and adapted technologies and alternative fuels and plan appropriately for this important work stream. The overall aim is to ensure that safety (and consequential environmental protection) and efficiency of shipping are maintained, and potentially improved, so that the flow of seaborne international trade continues to be smooth and efficient.

The practicality, feasibility and proportionality of the proposed output

21 The task ahead is complex and requires engagement of all those who are involved in determining the future of ship design and operation. The Committee is well equipped to initiate the needed comprehensive assessment which will be proportionate to the objectives set by the Organization and deliver on its mission. The involvement of all relevant stakeholders in that very specific and time-bound assessment makes the achievement of the outcome feasible while the tools and the expertise at Committee's disposal assure a practical approach.

The cost to the maritime industry and the relevant legislative and administrative burdens

22 The estimated scale of cumulative investment needed between 2030 and 2050 to achieve the current IMO target of reducing carbon emissions from shipping by at least 50% by 2050, is approximately \$1-1.4 trillion, or on average between \$50-70 billion annually for 20 years⁴ and this will have to increase, if the emission reduction target is increased as part of the revision of the Initial IMO strategy on reduction of GHG emissions from ships. The predicted costs of offering solutions to allow building of zero-GHG emitting ships represents a significant investment by OEMs (original equipment makers) and shipowners/builders. Lack of predictability and level playing field as a result of absent international regulations (ensuring the safety of ships using the necessary technologies and fuels) stifles investment in new technologies that could reduce the costs to industry. The availability of a coherent road map to delivering a regulatory framework within the purview of the Committee would offer a degree of confidence to invest and would reduce the risk of stranded assets and loss of return on that investment. That will inevitably contribute positively to achieving the GHG reduction goals of the Organization at the needed pace. Execution of such a road map would also go a long way to improving efficiencies during PSC inspections thus reducing the cost to the industry and Governments by way of an equitable safety regime governing the use of technologies and fuels deployed to reduce GHG emissions.

23 Given the current proposal is to undertake a regulatory assessment as a first step, there would be no costs to the maritime industry or administrative requirements arising from this step of the output in itself, and the *Checklist for identifying administrative requirements*, as set out in annex 1, has been completed on that basis.

The benefits (e.g. enhanced maritime safety, maritime security, protection of the marine environment, or facilitation of maritime traffic) that are expected to be derived from the inclusion of the proposed output

24 As the technology and alternative fuels mature there will be an increasing number of maritime activities which would benefit the delivery of GHG reduction goals in a safe manner.

⁴ Data source: <https://www.globalmaritimeforum.org/news/the-scale-of-investment-needed-to-decarbonize-international-shipping>

25 Following the assessment, the Committee would have to consider how best to address any issues identified, and it is the intention that the assessment would provide the basis for consideration of the implications at that stage.

26 However, the co-sponsors note that the consequences of not undertaking the proposed assessment could contribute to the proliferation of ships unregulated by international instruments, which may lead to adverse impacts on maritime safety, security and the protection of the marine environment.

Do adequate industry standards exist or are they being developed?

27 Individual Member States participating in pilot projects are developing their own approaches to assessment of safety. Land-based requirements exist, however validation for the purpose of marine application has to be carried out. IACS is developing classification safety requirements for ships as part of its 'safe decarbonization' programme.

Has the proposed output been properly specified in SMART terms (specific, measurable, achievable, realistic, time-bound)?

28 Therefore, the co-sponsors consider that there is a need to establish an output under the purview of the Maritime Safety Committee, to initiate and undertake a regulatory assessment of the instruments under its purview so that there is a common understanding of the measures which would be necessary to enable safe operation of ships using new technologies and alternative fuels. This would be an initial step, which will help formulate a road map and deliver a regulatory framework in support of safe reduction in GHG emissions from ships.

29 The following new output is proposed:

"A comprehensive regulatory assessment to deliver a regulatory framework for the safe reduction of GHG emissions from ships".

30 Without prejudicing the Committee's consideration of this document and the actual approach taken, the co-sponsors consider that this work stream could be organized into the following sub-tasks:

- .1 highlight the new and adapted technologies and alternative fuel sources that the industry is considering in response to GHG targets being set by the Organization;
- .2 highlight all instruments under the Committee's purview that cause a barrier to deployment of the solutions in .1 and any gaps in the regulations that would be needed to safely deploy the same;
- .3 develop a road map to delivering a regulatory framework to remove barriers and gaps in highlighted in .2 prioritizing those instruments needed to deploy those solutions being in the highest demand; and
- .4 implement the road map.

31 The co-sponsors note that the proposed output would initially address sub-tasks 1 and 2 above.

32 The scope of this regulatory assessment would need to determine the feasibility of the uptake of the technology/fuel (i.e. those technologies/fuels being considered by industry and therefore demonstrating technology readiness), the state of knowledge of risks and the technical considerations of solutions. An assessment of the results of various trials and projects within a structured process by the Committee should determine the most appropriate course of action keeping in mind a distinction between energy storage (fuels), converters (e.g. engines, fuel cells, reactors) and abatement technologies (e.g. carbon capture and storage). In this regard, delegations from the Member States, IGOs and NGOs should be prepared to submit relevant information to assist this assessment of trials for the purpose of prioritizing future work as part of any road map. In its conceptual approach, the process may take inspiration from the work the Committee has performed, and is progressing, on MASS, where the education and sharing of common understanding is a major by-product of that effort.

33 The co-sponsors stress that in undertaking this work, the Organization should remain technology neutral, i.e. not "push" industry to any particular solution to reducing GHG emissions. Instead, the focus should be to facilitate a regulatory framework in response to technologies and fuels being considered now and, in the future, to ensure that the shipping industry can make its own informed decisions and deploy the chosen solutions within a regulatory framework that will ensure the continued safety and security to those on board and the marine environment.

34 Considering the multifaceted nature of the work, the Committee would need to manage strands of work of its various Sub-Committees (SSE, HTW, SDC, etc.) and coordinate the progress with MEPC, where measures enabling the reduction of GHG emissions are being considered. Since most of the sub-committees to be involved in this work are already overloaded, a mechanism to consider the work in sub-committees in order to streamline their work and manage expectations regarding the delivery of the requested products may be necessary.

Does the completed checklist for addressing the human element (see annex 5) demonstrate that the human element has been sufficiently considered and addressed?

35 Given the initial steps of the current proposal are only to undertake a regulatory assessment there would be no implications for the Human Element arising from this output in itself, and the *Checklist for identifying human element issues*, as set out in annex 2, has been completed on this basis. However, the co-sponsors consider that there will be an impact on the human element both on board and ashore, which has to be assessed once specifics are determined within the assessment, and as such the human element would be an area of consideration within the proposed assessment⁵.

If inclusion of the output in the current biennium is proposed, is this action properly justified?

36 Considering the current work to revise the initial IMO GHG strategy, the need to have predictability and level playing field to design, build and crew safe ships contributing to the ultimate objective of zero-GHG-emitting ships will only grow, necessitating clarity of applicable safety regulations. Therefore, the co-sponsors consider that there is an urgency in starting the assessment. As such, it is proposed that the output should be included in the Committee's biennial agenda (2024-25), with three sessions needed to complete the assessment and formulate a road map to delivering a regulatory framework for the safe reduction in GHG emissions from ships.

⁵ Recognition is made of the SD 6: Address the human element in resolution A.1149(32).

37 The Committee is considered to be the appropriate body to complete this assessment and coordinate the work given it would cut across the remit of different subsidiary bodies; it is therefore envisaged that input from subsidiary bodies to the areas related to their technical expertise may also be needed at some stage.

Would a decision to reject or postpone the commencement of the work in relation to the proposal pose an unreasonable risk to the Organization's overall mission?

38 As mentioned above, the absence of a coherent approach to safety of GHG reduction of shipping and a plan of regulatory action may cause unintended consequences whereby accidents, causes of which lie outside the scope of international regulations, could lead to disqualification at the international level of promising solutions on grounds of safety risk, and introducing inefficiencies due to rejection by PSC by one State not accepting the use of a technology or fuel accepted by another. Both aspects could undermine the mission of the Organization.

Action requested of the Committee

39 The Committee is invited to consider the foregoing, in particular the proposals in paragraphs 29 and 36 as well as the invitation to Member States, IGOs and NGOs to submit information to a future session in paragraph 32, and take action as appropriate.

ANNEX 1

CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS

This checklist should be used when preparing the analysis of implications required in submissions of proposals for inclusion of outputs. For the purpose of this analysis, the term "administrative requirement" is defined in accordance with resolution A.1043(27), as an obligation arising from a mandatory IMO instrument to provide or retain information or data.

Instructions:

- (A) If the answer to any of the questions below is **YES**, the Member State proposing an output should provide supporting details on whether the requirements are likely to involve start-up and/or ongoing costs. The Member State should also give a brief description of the requirement and, if possible, provide recommendations for further work, e.g. would it be possible to combine the activity with an existing requirement?
- (B) If the proposal for the output does not contain such an activity, answer **NR** (Not required).
- (C) For any administrative requirement, full consideration should be given to electronic means of fulfilling the requirement in order to alleviate administrative burdens.

1. Notification and reporting? Reporting certain events before or after the event has taken place, e.g. notification of voyage, statistical reporting for IMO Members	NR	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
2. Record keeping? Keeping statutory documents up to date, e.g. records of accidents, records of cargo, records of inspections, records of education	NR	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
3. Publication and documentation? Producing documents for third parties, e.g. warning signs, registration displays, publication of results of testing	NR	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
4. Permits or applications? Applying for and maintaining permission to operate, e.g. certificates, classification society costs	NR	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		
5. Other identified requirements?	NR	Yes <input type="checkbox"/> Start-up <input type="checkbox"/> Ongoing
Description of administrative requirement(s) and method of fulfilling it: (if the answer is yes)		

ANNEX 2

CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

MSC-MEPC.1/Circ.5/Rev.4, annex 5

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
Workload			<i>Other relevant references may be added</i> <i>Strikeout references that are not relevant</i>	<i>If answer to question is "yes" identify considerations. If answer is "no" make proper justification</i>	<i>Identify how human element considerations should be addressed in the output</i>
1	Does the "output" affect workload?	No			
1.1	On board, especially in the already intensive phases of the voyage and port operations to:		<i>Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.8)</i> <i>Guidelines on fatigue (MSC.1/Circ.1598)</i> <i>Principles of minimum safe Manning (resolution A.1047(27))</i> <i>Guidelines for the investigation of accidents where fatigue may have been an issue (MSC/Circ.621)</i>		

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
1.1.1	Operations including navigation, cargo and engineering	No		There will be no change to current onboard practice.	
1.1.2	Maintenance of the ships structure and its equipment	No		There will be no change to current onboard practice.	
1.1.3	Onboard administration in support of the ships' management systems	No		There will be no change to current onboard practice.	
1.1.4	Onboard administration related to regulation involving flag States, classification societies, port State and other bodies such as charterers and port authorities	No		There will be no change to current onboard practice.	
1.1.5	Increased workload or time pressure on personnel if involved in implementation of changes prior to the implementation date	No		There will be no change to current onboard practice.	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
1.2	Ashore, in a manner that would affect the ships operation to:				
1.2.1	Companies' administration	No		There will be no change to current practices.	
1.2.2	Flag State, port State and classification societies administration such that certification and other processes are compromised or delayed	No			

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
	Decision-making		<i>Other relevant references may be added</i> <i>Strikeout references that are not relevant</i>	<i>If answer to question is "yes" identify considerations. If answer is "no" make proper justification</i>	<i>Identify how human element considerations should be addressed in the output</i>
2	Does the "output" impact decision-making on board the ship?				
2.1	By confusion with existing requirements and regulations	No		There is no impact on onboard decision-making.	
2.2	By changing responsibilities as laid out in the ISM Code	No		Responsibilities on board the ship will not change.	
2.3	By creating complexity in its implementation and/or in the safety management systems	No		There is no change to onboard decision-making.	
2.4	By requiring increased mental effort, such as the need to find, transform and analyse data or result in the need to make judgements based on incomplete information	No		There will be no change to the mental effort by the crew.	
2.5	By limiting the time available to establish situational awareness, decide, communicate (possibly across time zones) or check	No		There will be no change to the time available to establish situational awareness.	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
2.6	By increasing reliance on judgement and administrative controls to manage major risks such as oil spills and collisions	No		There will be no change to the reliance on judgement and administrative controls to manage major risks.	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
	Living and Working Environment		Other relevant references may be added Strikeout references that are not relevant	If answer to question is "yes" identify considerations. If answer is "no" make proper justification	Identify how human element considerations should be addressed in the output
3	Does the "output" affect the living and working environment?		Guidelines on the basic elements of a shipboard occupational health and safety programme (MSC-MEPC.2/Circ.3) Guidelines on fatigue (MSC.1/Circ.1598)		
3.1	By interfering with existing arrangements for abandonment, fire-fighting and other emergency plans or procedures	No		There will be no impact on existing arrangements for abandonment, fire-fighting and other emergency plans or procedures	
3.2	By introducing new materials that could create an explosion, fire, environmental or occupational health risk	No		The proposal does not introduce new materials that could create an explosion, fire, environmental or occupational health risk	
3.3	By introducing new high energy sources such as high-voltage, high pressure fluids	No		The proposal does not introduce new high energy sources such as high-voltage, high pressure fluids	
3.4	By affecting access or egress and causing lack	No		The proposal does not affect access or egress	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
	of ventilation in working spaces			and causing lack of ventilation in working spaces	
3.5	By affecting the habitability of accommodation spaces due to noise, vibration, temperatures, dust and other contaminants	No		The proposal does not affect the habitability of accommodation spaces due to noise, vibration, temperatures, dust and other contaminants	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
	Operation and Maintenance		<p><i>Other relevant references may be added</i></p> <p><i>Strikeout references that are not relevant</i></p>	<p><i>If answer to question is "yes" identify considerations. If answer is "no" make proper justification</i></p>	<p><i>Identify how human element considerations should be addressed in the output</i></p>
4.	Does the "output" affect the operation and maintenance of the ship, its structure or systems and equipment?		<p><i>Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.8)</i></p> <p><i>Guidelines for bridge equipment and systems, their arrangement and integration (BES) (SN.1/Circ.288)</i></p> <p><i>Principles of minimum safe manning (resolution A.1047(27))</i></p> <p><i>Issues to be considered when introducing new technology on board ships (MSC/Circ.1091)</i></p> <p><i>Guidelines on software quality assurance and human-centred design for e-navigation (MSC.1/Circ.1512)</i></p> <p><i>Guidelines for the standardization of user interface design for navigation equipment (MSC.1/Circ.1609)</i></p>		

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
4.1	By introducing equipment that the user may find difficult to operate or maintain or may be unreliable	No		The proposal does not introduce equipment that the user may find difficult to operate or maintain or may be unreliable	
4.2	By introducing new and/or novel technology, or technology that changes the role of the person	No		The proposal does not introduce new and/or novel technology, or technology that changes the role of the person	
4.3	By introducing requirements for new competencies and roles	No		The proposal does not introduce new competencies and roles	
4.4	By overloading existing infrastructure such as power generation and ventilation systems	No		The proposal does not change existing infrastructure such as power generation and ventilation systems	
4.5	By poor integration with existing systems and controls	No		The proposal does not require integration with existing systems and controls.	
4.6	By introducing new and unfamiliar operations/procedures	No		The proposal does not introduce new and unfamiliar operations/procedures	
4.7	By introducing new and unfamiliar operating interfaces?	No		The proposal does not introduce new and unfamiliar operating interfaces	
4.8	By introducing risks to the ship during any modifications required prior to the implementation date of the output	No		The proposal does not require modifications to the ship prior to the implementation date of the output	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
	Measures to address the human element		Other relevant references may be added Strikeout references that are not relevant	If answer to question is "yes" identify considerations. If answer is "no" make proper justification	Identify how human element considerations should be addressed in the output
5.	Does the "output" require changes to:		Shipboard technical operating and maintenance manuals (MSC.1/Circ.1253) Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.8)		
5.1	Training	No		No new training requirements are envisaged as part of this proposal.	
5.2	Practical skill development and competences	No		No changes to practical skill development and competences are needed.	
5.3	Operating, management and/or maintenance procedures	No		No changes are needed to operating, management or maintenance procedures	
5.4	Information/manuals for operation and maintenance	No		No changes are needed to information/manuals for operation and maintenance	

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
5.5	Spares outfit	No		No changes are needed to spares outfit.	
5.6	Occupational safety requirements including guarding and PPE	No		No changes are needed to occupational safety requirements.	
5.7	Shore support	No		No changes are needed to shore support	
