

MARITIME SAFETY COMMITTEE
107th session
Agenda item 17

MSC 107/17/14
27 February 2023
Original: ENGLISH
Pre-session public release:

WORK PROGRAMME

Proposal for a new output for development of an MSC circular to address time pressure and related organizational factors

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SUMMARY

Executive summary: This document proposes a new output for development of an MSC circular to address time pressure and related organizational factors. The effect of time pressure on incidents and accidents is discussed and the possibility of organizational "barriers" which could be applied to deal with this threat, is also discussed.

Strategic direction, if applicable: 1, 6 and 7

Output: Not applicable

Action to be taken: Paragraph 23

Related documents: None

Introduction

1 This document is submitted in accordance with the provisions of paragraph 6.12 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) and contains a proposal for the development of a circular to provide greater clarity in relation to the hazard of time pressure, which has resulted in a significant number of accidents and incidents, including fatalities.

IMO objectives

2 This new output is fully in line with the IMO vision statement declared in resolution A.1149(32) on *Revised Strategic Plan for the Organization for the six-year period 2018 to 2023*, as it will support to uphold IMO's Vision Statement detailed therein. The proposal follows the overarching principles established in the Strategic Plan, in which IMO has committed itself to projecting shipping as an important enabler for a substantial number of Sustainable Development Goals (SDGs) outlined in the *2030 Agenda for Sustainable Development (2030 Agenda)*. The proposed output would provide information on a hazard not currently covered by IMO regulations and propose actions to mitigate the resultant risk.

Background

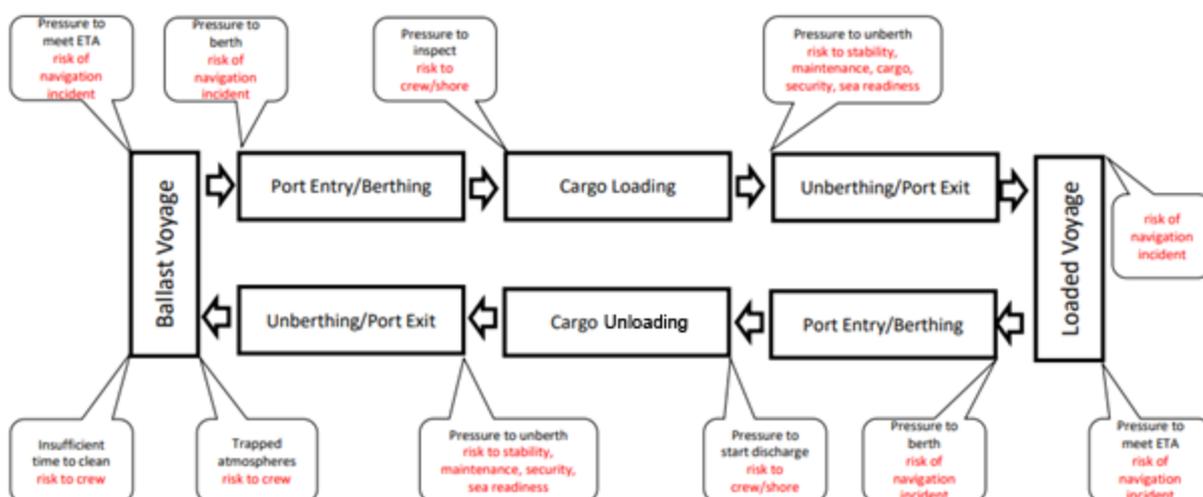
3 The Assembly, at its eighteenth session, approved resolution A.741(18) on *International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code)*. The introduction of the ISM Code has been a major step in the improvement of maritime safety and the protection of the environment.

4 The industry and its structure have changed considerably since the advent of the ISM Code. This continuing evolution and recent global events have resulted in additional and increasing time pressures from the supply chain.

5 The Assembly, at its twenty-third session, introduced resolution A.947(23) on *Human Element Vision Principles and Goals for the Organization*, recognizing the impact of the human element on maritime safety, security and marine environmental protection. Consequently, there is a need to take account of the human element and the performance shaping factors which may lead to time pressure.

6 The proposal follows from a major review conducted by the co-sponsors and several other organizations into causes of enclosed space fatalities. The review also included a survey of seafarers and showed that enclosed space fatalities continue to be a significant cause of occupational fatalities on board ships. Document CCC 6/INF.7 on *Analysis on accidents 1999-2018 in relation to solid bulk cargoes*, provides related statistics. Additionally, the review analysed a number of investigation reports related to high-profile incidents such as the tragic capsizing of the **MS Herald of Free Enterprise** on 6 March 1987. The review found that although the reports highlighted breach of procedures as the immediate cause, the recurring underlying theme noted to be a cause of these breaches was time pressure.

7 The review also recognized that time pressure is relevant to a wide range of operations including navigation, cargo operations and mooring. Time pressure is currently not directly addressed in any IMO regulations. The figure below illustrates this for any number of risks that may include but are not limited to navigation, ship stability, machinery failure, security, crew safety, sea readiness, cargo/environmental damage, etc.



8 Recent events prove that the global supply chain is and continues to remain fragile. The progression of "just-in-time" production and logistics systems, sometimes referred to as lean production, leave little stock in place to cover interruptions in those systems, especially with reference to transportation of goods. The co-sponsors would like to note a distinction here with "Just In Time" arrival systems, also referred to as virtual arrival, the benefits of which are provided in the 2020 *Just In Time Arrival Guide* published by the GloMEEP Project Coordination Unit of IMO.

9 Optimization of "just-in-time" production and logistics systems puts significant time pressure on ships on voyage and in port. There is evidence to suggest that this has led to navigation incidents and loss of stability due to ships sailing with inadequate assessment of stability, as aptly demonstrated by the events leading up to the grounding of **MV Höegh Osaka** on 3 January 2015. The investigation of the collapse of cargo containers on **Annabella** on 26 February 2007, also clearly identified lack of "sufficient spare time" as an issue directly contributing to the accident, which reinforces the rationale behind the proposal in this submission.

Need

10 In an evolving global society and as economic activity increases, the need to get more done in lesser time has led to increasing time pressure and hence the potential of further accidents and incidents. Time pressure is not considered in current regulations and this proposal identifies a need to explicitly address time pressure in our regulatory instruments in order to ensure effective management of this risk at various levels.

Analysis of the issue

- 11 The review into time pressure identified three main types of time pressure:
- .1 explicit, or direct time pressure, where a person in the line of authority gives a specific instruction to someone lower in the organizational hierarchy to carry out a task in a defined time scale, which may not be realistic;
 - .2 implicit, or indirect time pressure, where "signals" are given and/or perceived that a task should be carried out quickly. This may, for example, be the result of performance targets; and
 - .3 self-induced time pressure, where the individual feels internal pressure to meet their own or others' needs.

12 The effect of time pressure is extensively discussed in human element texts and is shown to result in "fast thinking"¹ or the application of the "efficiency thoroughness trade-off"² resulting in a range of casualties. The review recognized that an efficient shipping industry is necessary, but that systems can be designed, operated and resourced to achieve safe operations with a fast turnaround, without resulting in "excessive time pressure", thereby reducing the chances of an accident or incident. There is a need for the industry to be specifically alerted to the concepts explained in paragraphs 12 and 13.

¹ Thinking, Fast and Slow, by Daniel Kahneman.

² Efficiency Thoroughness Trade-off, by Eric Hollnagel

13 The review carried out a qualitative analysis of the sources of time pressure and looked at organizational "barriers" which could be applied to deal with the threat of excessive time pressure and avoid the occurrence of an incident. This revealed some specific weaknesses in those procedural barriers. As an example, the barriers that could be used to mitigate excessive time pressure in the trading and commercial operation of a ship include:

- .1 pre-chartering risk assessment, which is generally carried out by commercial operators, is utilized to ensure the cargo is appropriate for the ship and the ports involved are "safe". This process could also consider time required or available to execute the charter as planned. This is a "strong" barrier and can safeguard the ship from multiple unsafe scenarios and effectively avoid incidents stemming from such charter;
- .2 "technical management" ashore has a role in reviewing the intended cargo, ports and time available to ensure that risks involving time pressure are addressed/mitigated;
- .3 the Designated Person (DP) has a role to monitor the safety and pollution prevention aspects of the operation of the ship by providing a link between the personnel on board and the highest level of management in the company; and
- .4 the master has "overriding authority" to make decisions related to safety and pollution prevention and may intervene if he/she perceives that time pressure is becoming excessive.

14 The analysis concluded that the effectiveness of barriers is affected by the structure of the organization and by its culture and leadership.

15 The ISM Code, as written, allows for time pressure to be addressed, but not all companies have explicitly included this specific risk in their Safety Management System (SMS). The structure of the industry and operational conditions have influenced the way that the ISM Code is applied and, indeed, audited for regulatory purposes which means that time pressure and other operational risks related to trading the vessel are not extensively covered. The issues below were identified in the report and relate to time pressure and other operational risks.

- .1 Good management is built around matching accountability and authority. Accountability cannot be delegated without the authority to manage that accountability. To split the authority and accountability exposes the delegate to "moral hazard". There is a need to ensure roles and structures, which may affect the safety of the vessel, crew and environmental protection, within the Safety Management System, are defined in this respect.
- .2 The ISM Code, while recognizing that there exists a variety of management structures, envisaged for the most part, an "integrated" organization with senior management accountable for all of those functions. It envisaged a shipowner directly in control of both the revenue from the ship's operation and the resources required to manage the ship in accordance with ISM. The Code recognized that "no two shipping companies are the same" and a wide range of "non-integrated" models exist and indeed dominate the industry. However, the ISM Code, as written, does not clearly match accountability and authority in "non-integrated" organizational structures and leaving lines of authority unclear. While in some cases contractual solutions may have

evolved, it is important that the Safety Management System and contractual arrangements ensure that current "non-integrated" organizational structures meet the original intent of the Code and embody all the protections therein.

- .3 The ISM Code requires the "company" to manage risks and ensure that key roles and lines of authority are defined. Substantial operational risks are embodied in the trading of the vessel as this determines where the ship should go, what it should carry and where it should load and what time is available to carry out these operations. While good practice does exist, in most cases the operational consequences of trading the vessel, particularly with regard to time pressure, are not included within the SMS. For the avoidance of doubt, commercial loss (such as cargo quality/quantity discrepancies) and risk should not be considered in the proposed circular.
- .4 The master's overriding responsibility is central to the safety of the vessel and environmental protection. In a non-integrated operation the master may have to coincide with differing and often ambiguous instructions from several entities. The master's authority needs to be clearly defined in the SMS and supported, especially in the context of port operation and in decisions relating to trading the vessel. In a world of instantaneous communications, the master is always in touch with the company. The impact of modern communications and other developments on the role of the master should also be considered.
- .5 It is important that, other than in urgent operational situations requiring immediate action, the master's overriding responsibility is recognized as the last in a series of safety barriers and not the only one. As such, situations in which the master must use that authority should result in an investigation of the other barriers and their effectiveness.

Analysis of implications

16 It is considered that the proposed new output will not lead to any additional administrative requirements or burdens and in this regard, the completed administrative checklist, as set out in annex 6 to the annex to 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), is set out in the annex.

Benefits

17 Addressing the "organizational factors" related to time pressure will reduce the number of incidents and accidents and lead to improvement in safety of personnel and in the safe operation of the ship.

Industry standards

18 While there is some limited guidance available, there are currently no standards within the shipping industry that explicitly address time pressure.

Proposal

19 The co-sponsors propose a new output "Development of an MSC circular to address time pressure and related organizational factors".

20 It is anticipated that, if the Committee approves this output, it should be referred to the HTW Sub-Committee as the coordinating organ, in association with the III Sub-Committee where requested, with one session required to complete the work.

Human element

21 The completed checklist contained in the *Checklist for considering and addressing the human element* (MSC-MEPC.1/Circ.5/Rev.4) is set out in the appendix to the annex.

Urgency

22 As mentioned in paragraphs above, time pressure is an underlying cause in many maritime safety related accidents and incidents. The issue is deemed urgent and it is proposed that the output, if approved, be put on the 2024-2025 biennium and the provisional agenda of HTW 10.

Action requested of the Committee

23 The Committee is invited to consider the proposal in paragraphs 19 and 20 and take action as appropriate.

ANNEX

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.

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

APPENDIX

CHECKLIST FOR CONSIDERING AND ADDRESSING THE HUMAN ELEMENT

This checklist consists of five questions as follows:

- .1 questions 1 to 4 are risk-based questions intended to identify risks from the implementation and operation of new outputs; and
- .2 question 5 is a list of measures for addressing the human element.

	1 Question	2 Yes/ No	3 IMO References	4 Considerations	5 Instructions
Workload			<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>
1	Does the "output" affect workload?				
1.1	On board, especially in the already intensive phases of the voyage and port operations to:		<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 on fatigue (MSC.1/Circ.1598)</i></p> <p><i>Principles of minimum safe manning (Resolution A.1047(27))</i></p> <p><i>Guidelines for the investigation of accidents where fatigue may have been an issue (MSC/Circ.621)</i></p>		
1.1.1	Operations including navigation, cargo and engineering	No		The output is a request for guidance in the form of MSC circular	N/A
1.1.2	Maintenance of the ships structure and its equipment	No		The output is a request for guidance in the form of MSC circular	N/A

	1 Question	2 Yes/ No	3 IMO References	4 Considerations	5 Instructions
1.1.3	Onboard administration in support of the ships' management systems	No		The output is a request for guidance in the form of MSC circular	N/A
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		The output is a request for guidance in the form of MSC circular	N/A
1.1.5	Increased workload or time pressure on personnel if involved in implementation of changes prior to the implementation date	No		The output is a request for guidance in the form of MSC circular	N/A
1.2	Ashore, in a manner that would affect the ships operation to:				
1.2.1	Companies' administration	Yes	<i>Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.8)</i>	Clarity provided to ship operators about time pressure issues that could lead to incidents/accidents	N/A
1.2.2	Flag State, port State and classification societies administration such that certification and other processes are compromised or delayed	No		The output is a request for guidance in the form of MSC circular	N/A

	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		The output relates to guidance to ship operators to manage time pressure	N/A
2.2	By changing responsibilities as laid out in the ISM Code	No		The output relates to guidance to ship operators to manage time pressure	N/A
2.3	By creating complexity in its implementation and/or in the safety management systems	No		The output relates to guidance to ship operators to manage time pressure	N/A
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		The output relates to guidance to ship operators to manage time pressure	N/A

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
2.5	By limiting the time available to establish situational awareness, decide, communicate (possibly across time zones) or check	No		The output relates to guidance to ship operators to manage time pressure	N/A
2.6	By increasing reliance on judgement and administrative controls to manage major risks such as oil spills and collisions	No		The output relates to guidance to ship operators to manage time pressure	N/A

	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		The output relates to guidance to ship operators to manage time pressure	N/A
3.2	By introducing new materials that could create an explosion, fire, environmental or occupational health risk	No		The output relates to guidance to ship operators to manage time pressure	N/A
3.3	By introducing new high energy sources such as high-voltage, high pressure fluids	No		The output relates to guidance to ship operators to manage time pressure	N/A
3.4	By affecting access or egress and causing lack of ventilation in working spaces	No		The output relates to guidance to ship operators to manage time pressure	N/A

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
3.5	By affecting the habitability of accommodation spaces due to noise, vibration, temperatures, dust and other contaminants	No		The output relates to guidance to ship operators to manage time pressure	N/A

	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>Guideline on software quality assurance and human-centred design</i></p>		

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
			<p>for <i>e-navigation</i> (MSC.1/Circ.1512)</p> <p><i>Guidelines for the standardization of user interface design for navigation equipment</i> (MSC.1/Circ.1609)</p>		
4.1	By introducing equipment that the user may find difficult to operate or maintain or may be unreliable	No		The output relates to guidance to ship operators to manages time pressure	N/A
4.2	By introducing new and/or novel technology, or technology that changes the role of the person	No		The output relates to guidance to ship operators to manage time pressure	N/A
4.3	By introducing requirements for new competencies and roles	No		The output relates to guidance to ship operators to manage time pressure	N/A
4.4	By overloading existing infrastructure such as power generation and ventilation systems	No		The output relates to guidance to ship operators to manage time pressure	N/A
4.5	By poor integration with existing systems and controls	No		The output relates to guidance to ship operators to manage time pressure	N/A
4.6	By introducing new and unfamiliar operations/procedures	No		The output relates to guidance to ship operators to manage time pressure	N/A

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
4.7	By introducing new and unfamiliar operating interfaces?	No		The output relates to guidance to ship operators to manage time pressure	N/A
4.8	By introducing risks to the ship during any modifications required prior to the implementation date of the output	No		The output relates to guidance to ship operators to manage time pressure	N/A

	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		The output relates to guidance to ship operators to manage time pressure	N/A
5.2	Practical skill and development competences	No		The output relates to guidance to ship operators to manage time pressure	N/A
5.3	Operating, management and/or maintenance procedures	Yes	Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies (MSC-MEPC.7/Circ.8)	Clarity provided to ship operators and shipboard staff about time pressure issues that could lead to incidents/accidents	N/A

	1 Question	2 Yes/No	3 IMO References	4 Considerations	5 Instructions
5.4	Information/manuals for operation and maintenance	No		The output relates to guidance to ship operators to manage time pressure	N/A
5.5	Spares outfit	No		The output relates to guidance to ship operators to manage time pressure	N/A
5.6	Occupational safety requirements including guarding and PPE	No		The output relates to guidance to ship operators to manage time pressure	N/A
5.7	Shore support	No		The output relates to guidance to ship operators to manage time pressure	N/A