

MARITIME SAFETY COMMITTEE
98th session
Agenda item 20

MSC 98/20/4
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WORK PROGRAMME

Provisions for fixed fire detection and alarm systems (chapter 9 of the FSS Code)

Submitted by Antigua and Barbuda, Jamaica, IACS and CLIA

SUMMARY

Executive summary: This document proposes a new output for fault isolation requirements for individually identifiable fire detector systems installed in lieu of section identifiable fire detector systems on cargo ships and passenger ship cabin balconies

Strategic direction: 2

High-level action: 2.0.1

Output: No related provisions

Action to be taken: Paragraph 25

Related documents: SSE 2/11/4, SSE 2/20 (paragraphs 11.14 and 11.15); SSE 3/12/14 and SSE 3/16 (paragraph 12.8)

Introduction

1 This document is submitted in accordance with paragraph 4.6 of the annex and annex 1 to the annex 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), taking into account the Organization's objectives (resolutions A.900(21) and A.909(22)) and the *High-level Action Plan for the Organization and priorities for the 2016-2017 biennium* (resolution A.1098(29)).

Background

2 The Sub-Committee on Ships Systems and Equipment (SSE), at its second session, considered document SSE 2/11/4 (IACS) and advised that the following revision of the fault isolation requirements for zone address identification, i.e. individually identifiable systems, in paragraph 2.1.4.1 of chapter 9 of the FSS Code to what is now required for individually identifiable fire detectors in paragraph 2.1.6.1 of chapter 9 of the FSS Code, as amended by resolution MSC.311(88), was intentional:

- .1 The previous requirement in paragraph 2.1.4.1 of chapter 9 specified that "any fault occurring in the loop will not render the whole loop ineffective". In addition, "loop" was defined by IACS UI SC117 and *Unified interpretations of SOLAS chapter II-2, the FSS Code, the FTP Code and related fire test procedures* (MSC/Circ.1120) as being an "electrical circuit linking detectors of various sections in a sequence and connected (input and output) to the indicating unit(s)". In other words, a fault could affect a section (portion of a loop), but not the whole loop.
- .2 The current requirement in paragraph 2.1.6.1 specifies that "any fault (e.g. power break, short circuit, earth, etc.) occurring in the section will not prevent the continued individual identification of the remainder of the connected detectors in the section".

3 SSE 2 invited IACS to note the above view and submit comments and proposals, if any, for further consideration by SSE 3. Member States were also invited to consider whether any amendments to the FSS Code needed to be proposed in this regard.

4 Document SSE 3/12/14 (IACS) responded to the invitation of SSE 2 and summarized the amendments to chapter 9 of the FSS Code, as amended by resolution MSC.311(88), as follows:

- .1 the more onerous fault isolation requirements on individually identifiable systems require an isolator module for each fire detector in such a way that a fault would result in the loss of only one detector; and
- .2 the less onerous fault requirements for section identifiable systems, which are only acceptable for cargo ships and for passenger ship cabin balconies, allow for the loss of the fire detectors in the affected section where a fault occurs.

5 Paragraph 12.8 of document SSE 3/16 states "the IACS view that the amendments introduced by resolution MSC.311(88) place more onerous fault requirements on individually identifiable systems than on section identifiable systems has received no strong support". From reviewing the audio file of the discussion (15 March 2016, morning session 11.44 to 11.58 a.m.), it appears that delegations were evenly split on the analysis and views expressed by IACS and the Chair concluded that the matter needed to be taken up with the Committee. In order to take forward the issues raised in document SSE 3/16, the co-sponsors understand that a new output is needed to be agreed by the Committee.

IMO's objectives

6 The proposal in this document is considered to be entirely consistent with, and supportive of, the objectives of the Organization, as explained in resolutions A.777(18) and A.900(21), respectively, in particular:

"Invites the attention of the Committees to resolution A.500(XII) and in particular its recommendation that proposals for new conventions or amendments to existing conventions be entertained only on the basis of clear and well-documented compelling need and having regard to the costs of the maritime industry".

"Desiring to ensure the Organization's continued promotion of quality shipping in accordance with its status as the world's foremost maritime institution".

7 Furthermore, the co-sponsors note that Strategic Direction 2 (SD 2) of the updated *Strategic plan for the organization (for the six-year period 2016 to 2021)* (resolution A.1097(29)) provides:

"SD 2 - IMO will foster global compliance with its instruments governing international shipping and will strive for their uniform implementation by Member States."

8 Taking into account SD 2, it is noted that the Assembly, at its twenty-ninth session, adopted resolution A.1098(29) in which the following High-level Action for the 2016-2017 biennium was agreed:

"2.0.1 Monitor and improve conventions, etc. and provide interpretation thereof if requested by Member States".

9 The following High-level Action which is also considered relevant in the context of this proposal was likewise agreed:

"5.2.1 Keep under review the technical and operational safety aspects of all types of ships, including fishing vessels".

Need

10 As discussed in documents SSE 2/11/4 and SSE 3/12/14 and again in paragraphs 2 to 5 above, the amendments to the FSS Code, as adopted by resolution MSC.311(88), place more onerous fault isolation requirements on individually identifiable systems than on section identifiable systems.

11 When a decision is being made on the type of identifiable system to be fitted on cargo ships or passenger ship cabin balconies, the cost and complexity of providing individually identifiable fault isolation versus section identifiable fault isolation is weighed against the enhanced safety afforded by individually identifiable fire detection versus section identifiable fire detection.

12 In light of the above, systems are available which combine the enhanced safety of individually identifiable fire detectors, which are required for passenger ships, with the less complex and less costly section identifiable fault isolation, which are acceptable for cargo ships and passenger ship cabin balconies only.

13 To accommodate the above and to provide for global and consistent acceptance of such a system, the co-sponsors consider that amendments to the fault isolation requirements for individually identifiable fire detector systems installed in lieu of section identifiable fire detector systems on cargo ships and passenger ship cabin balconies are needed.

Analysis of the issue

14 The co-sponsors consider that the practicability, feasibility and proportionality of the proposal are evident, taking into account that both individually identifiable systems and section identifiable systems are acceptable for cargo ships. While the implementation of the proposed amendment is feasible, i.e. it is possible and practical, the co-sponsors consider that it will also be practicable, i.e. it will easily be capable of being put into practice, in light of the systems that currently exist. The proposal would also satisfy the test of proportionality insofar as this action would not exceed what is necessary to achieve the overall objective of facilitating the global and consistent implementation of IMO agreed requirements.

Analysis of implications

15 The Committee is invited to note the information in annex 1, which provides the checklist for identifying administrative requirements and burdens as referred to in paragraph 4.15.6 of the annex and annex 5 to the annex to MSC-MEPC.1/Circ.5.

16 It is intended that these proposed amendments should be applied to systems installed on new ships and also to systems that are retrofitted in existing ships after the entry into force of the amendments. The co-sponsors consider that this amendment will provide a basis for clarity on the fault isolation requirements for individually identifiable fire detector systems installed in lieu of section identifiable fire detector systems on cargo ships and passenger ship cabin balconies by allowing for the application of less complex and less costly section identifiable fault isolation, yet still providing individually identifiable fire detection.

Benefits

17 It is considered that safety will be enhanced by amending the FSS Code, as it will clarify the acceptability of less complex and less costly section identifiable fault isolation for individually identifiable fire detector systems installed in lieu of section identifiable fire detector systems on cargo ships and passenger ship cabin balconies. In this regard, the following equipment combinations would become available:

Scope of Application	System Arrangement	Fire Detector Arrangement	Fault Isolation Arrangement
Passenger and cargo ships	Individually identifiable	Individually identifiable	Individual detector isolation
Cargo ships and passenger ship cabin balconies	Individually identifiable	Individually identifiable	Section isolation
	Section identifiable	Section identifiable	Section isolation

Industry standards

18 The FSS Code currently addresses fault isolation requirements for individually identifiable systems but not for section identifiable systems. However, by virtue of their design, a fault in a section identifiable system can affect all of the fire detectors in the section. IACS UI SC117 limits the extent of fault isolation in such a way that the number of individually identifiable fire detectors rendered ineffective due to a fault would not be larger than a section in a section identifiable system.

Output

19 The co-sponsors propose a new paragraph 2.1.8 in chapter 9 of the FSS Code which has been set out in annex 2 as a base text for further discussion.

20 As provided in paragraph 4.15.9 of the annex to MSC-MEPC.1/Circ.5, the output has been specified in SMART terms (specific, measureable, achievable, realistic and time-bound). Likewise, the proposed amendments to the FSS Code set out in annex 2 are considered to be specific, measureable, achievable and realistic (as discussed in particular in paragraph 14 above). In addition, this proposal does not rely on the availability of any new equipment or systems. This is considered relevant in terms of the time-bound element of the output, i.e. the

effective implementation of the proposal will not need to wait for any new technology to come to the market or for the development of new working procedures. Moreover, in terms of finalizing the Organization's consideration of the issue, reference is made to the paragraphs 23 and 24 below.

Human element

21 The completed checklist, as per the *Checklist for considering human element issues by IMO bodies* (MSC-MEPC.7/Circ.1), is set out in annex 3.

22 A system comprised of individually identifiable fire detectors, i.e. capable of identifying the exact location and type of detector or manually activated call point which has activated, with the less complex and less costly section identifiable fault isolation (currently acceptable for cargo ships and passenger ship cabin balconies only) will improve the responsiveness and effectiveness of resources and personnel necessary to extinguish a fire on cargo ships and in passenger ship cabin balconies as opposed to a section identifiable system which is capable of only identifying the section in which a detector or manually operated call point has activated.

Urgency

23 As this output and the consequent amendments to the FSS Code are directly related to the safety of ships, consideration of this issue should be addressed as a matter of priority and as soon as practicable within the working arrangements of the Organization, in particular, it is proposed that this output be included in the post-biennial (2018-2019) agenda of the SSE Sub-Committee. In this regard, annex 4 provides the information contained in paragraph 3.2.1.3.16 of the annex to *Guidance on drafting of amendments to the 1974 SOLAS Convention and related mandatory instruments* (MSC.1/Circ.1500).

24 Finally, it is intended that the draft text of the amendments set out in annex 2 could serve as a base text for further discussion.

Action requested of the Committee

25 The Committee is invited to consider the information provided and take action, as appropriate.

ANNEX 1

CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS

<p>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 requirements" is defined in resolution A.1043(27), i.e. administrative requirements are an obligation arising from future IMO mandatory instruments to provide or retain information or data.</p> <p>Instructions:</p> <p>(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?).</p> <p>(B) If the proposal for the output does not contain such an activity, answer NR (Not required).</p> <p>(C) For any administrative requirement, full consideration should be given to electronic means of fulfilling the requirement in order to alleviate administrative burdens.</p>		
<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 X</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 X</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 X</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 X</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 checked="" 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) Changes to National legislation in order to implement the proposed SOLAS amendment.</p>		

ANNEX 2*

**DRAFT AMENDMENTS TO THE INTERNATIONAL CODE FOR FIRE SAFETY SYSTEMS
(FSS CODE)**

**CHAPTER 9
FIXED FIRE DETECTION AND FIRE ALARM SYSTEMS**

2 Engineering specifications

1 A new paragraph 2.1.8 is added after the existing paragraph 2.1.7 as follows:

"2.1.8 In cargo ships and in passenger ship cabin balconies, where an individually identifiable system is fitted, notwithstanding the provisions in paragraph 2.1.6.1, isolator modules need not be provided at each fire detector if the system is arranged in such a way that the number and location of individually identifiable fire detectors rendered ineffective due to a fault would not be larger than an equivalent section in a section identifiable system, arranged in accordance with paragraph 2.4.1."

* Tracked changes are created using "strikeout" for deleted text and "grey shading" to highlight all modifications and new insertions, including deleted text.

ANNEX 3

CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

Instructions:	
If the answer to any of the questions below is:	
(A) YES , the preparing body should provide supporting details and/or recommendation for further work.	
(B) NO , the preparing body should make proper justification as to why human element issues were not considered.	
(C) NA (Not Applicable) the preparing body should make proper justification as to why human element issues were not considered applicable.	
Subject Being Assessed: (e.g. Resolution, Instrument, Circular being considered)	
Provisions of chapter 9 of the FSS Code.	
Responsible Body: (e.g. Committee, Sub-committee, Working Group, Correspondence Group, Member State)	
The Maritime Safety Committee and Ships Systems and Equipment Sub-Committee.	
1. Was the human element considered during development or amendment process related to this subject?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
2. Has input from seafarers or their proxies been solicited?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
3. Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
4. Have human element solutions been made as an alternative and/or in conjunction with technical solutions?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
5. Has human element guidance on the application and/or implementation of the proposed solution been provided for the following:	
• Administrations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Ship owners/managers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Seafarers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
• Surveyors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
6. At some point, before final adoption, has the solution been reviewed or considered by a relevant IMO body with relevant human element expertise?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
7. Does the solution address safeguards to avoid single person errors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
8. Does the solution address safeguards to avoid organizational errors?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
9. If the proposal is to be directed at seafarers, is the information in a form that can be presented to and is easily understood by the seafarer?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
10. Have human element experts been consulted in development of the solution?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
11. HUMAN ELEMENT: Has the proposal been assessed against each of the factors below?	
<input type="checkbox"/> CREWING. The number of qualified personnel required and available to safely operate, maintain, support, and provide training for system.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA

<input type="checkbox"/> PERSONNEL. The necessary knowledge, skills, abilities, and experience levels that are needed to properly perform job tasks.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> TRAINING. The process and tools by which personnel acquire or improve the necessary knowledge, skills, and abilities to achieve desired job/task	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc. to properly manage risks.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> WORKING ENVIRONMENT. Conditions that are necessary to sustain the safety, health, and comfort of those on working on board, such as noise, vibration, lighting, climate, and other factors that affect crew endurance, fatigue, alertness and morale.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> HUMAN SURVIVABILITY. System features that reduce the risk of illness, injury, or death in a catastrophic event such as fire, explosion, spill, collision, flooding, or intentional attack. The assessment should consider desired human performance in emergency situations for detection, response, evacuation, survival and rescue and the interface with emergency procedures, systems, facilities and equipment.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive, and sensory abilities of the user population	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
<p>Comments: (1) Justification if answers are NO or Not Applicable. (2) Recommendations for additional human element assessment needed. (3) Key risk management strategies employed. (4) Other comments. (5) Supporting documentation.</p> <p>(3) Are the solutions proposed for the subject in agreement with existing instruments? The intent of this proposal is to provide clarity on the provisions of the FSS Code with respect to fault detection requirements for individually identifiable fire detector systems that are installed in lieu of section identifiable fire detector systems on cargo ships.</p>	

ANNEX 4

**CHECK/MONITORING SHEET FOR THE PROCESSING OF AMENDMENTS TO THE
CONVENTION AND RELATED MANDATORY INSTRUMENTS
(PROPOSAL/DEVELOPMENT)**

Part I – Submitter of proposal (refer to section 3.2.1.1)

1	<i>Submitted by (Document Number and submitter)</i> MSC 98/20/4, Antigua and Barbuda, Jamaica, CLIA and IACS
2	<i>Meeting session</i> MSC 98
3	<i>Date (date of submission)</i> 3 March 2017

Part II – Details of proposed amendment(s) or new mandatory instrument (refer to sections 3.2.1.1 and 3.2.1.2)

1	<i>High-level action plan</i> 2.0.1
2	<i>Planned output</i> To be developed
3	<i>Recommended type of amendments (MSC.1/Circ.1481) (delete as appropriate)</i> <ul style="list-style-type: none"> • Four-year cycle of entry into force • exceptional circumstance
4	<i>Instruments intended for amendment (SOLAS, LSA Code, etc.) or developed (new code, new version of a code, etc.)</i> Chapter 9 of the FSS Code
5	<i>Intended application (scope, size, type, tonnage/length restriction, service (International/non-international), activity, etc.)</i> Cargo ships and passenger ship cabin balconies to which SOLAS regulation II-2 apply
6	<i>Application to new/existing ships</i> New and existing ships
7	<i>Proposed coordinating sub-committee</i> Ship Systems and Equipment (SSE) Sub-Committee
8	<i>Anticipated supporting sub-committees</i>
9	<i>Time scale for completion</i> 2019
10	<i>Expected date(s) for entry into force and implementation/application</i> 1 January 2024
11	<i>Any relevant decision taken or instruction given by the Committee</i>