



Council of the
European Union

Brussels, 15 July 2016
(OR. en)

11081/16

MAR 193
OMI 49

COVER NOTE

From:	Secretary-General of the European Commission, signed by Mr Jordi AYET PUIGARNAU, Director
date of receipt:	14 July 2016
To:	Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of the European Union

No. Cion doc.:	SWD(2016) 252 final
Subject:	COMMISSION STAFF WORKING DOCUMENT For the Council Shipping Working party IMO – Union submission to be submitted to the 97th session of the Committee on Maritime Safety (MSC 97) of the IMO in London from 21 – 25 November 2016 concerning a new work programme item in relation to fire safety of ro-ro passenger ships

Delegations will find attached document SWD(2016) 252 final.

Encl.: SWD(2016) 252 final



Brussels, 14.7.2016
SWD(2016) 252 final

COMMISSION STAFF WORKING DOCUMENT

For the Council Shipping Working party

IMO – Union submission to be submitted to the 97th session of the Committee on Maritime Safety (MSC 97) of the IMO in London from 21 – 25 November 2016 concerning a new work programme item in relation to fire safety of ro-ro passenger ships

COMMISSION STAFF WORKING DOCUMENT
For the Council Shipping Working party

IMO – Union submission to be submitted to the 97th session of the Committee on Maritime Safety (MSC 97) of the IMO in London from 21 – 25 November 2016 concerning a new work programme item in relation to fire safety of ro-ro passenger ships

PURPOSE

The document in Annex contains a draft Union submission to the 97th session of the Committee on Maritime Safety (MSC97) of the IMO concerning a new work programme item. It is hereby submitted to the appropriate technical body of the Council with a view to achieving agreement on transmission of the documents to the IMO prior to the required deadline of 19 August 2016¹.

Article 6(2)(a)(i) of Directive [2009/45/EC](#) on Safety Rules and Standards for Passenger Ships makes the application of SOLAS in its up-to-date version applicable to new Class A ships. The draft submission concerns amendments to SOLAS II-2 regulation 20 (Protection of vehicle, special category and ro-ro spaces) that will have a direct impact on Class A ships and therefore the said draft Union submission falls under EU exclusive competence.

¹ The submission of proposals or information papers to the IMO, on issues falling under external exclusive EU competence, are acts of external representation. Such submissions are to be made by an EU actor who can represent the Union externally under the Treaty, which for non-CFSP (Common Foreign and Security Policy) issues is the Commission or the EU Delegation in accordance with Article 17(1) TEU and Article 221 TFEU. IMO internal rules make such an arrangement absolutely possible as regards existing agenda and work programme items. This way of proceeding is in line with the General Arrangements for EU statements in multilateral organisations endorsed by COREPER on 24 October 2011.

ANNEX

MARITIME SAFETY COMMITTEE

MSC 97/19/XX

97th session

Agenda item 19

Original: ENGLISH

WORK PROGRAMME

Fire safety of ro-ro passenger ships

Submitted by the European Commission on behalf of the European Union

SUMMARY

<i>Executive summary:</i>	This paper proposes the establishment of a new unplanned output for the Committee concerning fires on ro-ro decks of passenger ships.
<i>Strategic direction:</i>	5.2
<i>High-level action:</i>	5.2.1, 5.2.2
<i>Planned output:</i>	No related provisions
<i>Action to be taken:</i>	Paragraph 33
<i>Related documents</i>	MSC-MEPC.1/Circ.4/Rev.4, MSC-MEPC.7/Circ1, FSI 20/5/3, FSI 21/5, FP 56/13, SSE 2/INF.3, MSC 96/6/2, MSC 96/25, MSC 96/INF.3 and MSC 96/16/1

Introduction and Background

1 This document is submitted in accordance with paragraph 4.8 and Annex I of the *Guidelines on 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.4/Rev.4) on the submission of proposals for new unplanned outputs.

2. A number of concerns have been identified with regards to the fire safety of ro-ro ships. Those concerns and a description of some possible solutions are provided in this paper.

3. Document FSI 20/5/3 (United Kingdom) drew attention to a vehicle deck fire on the ro-ro passenger ship **Commodore Clipper** (GISIS reference C0008451) which occurred in 2010. This document recalled other vehicle deck fire casualties; namely, **Al Salaam Boccaccio 98** (GISIS reference C0005748), **Und Adriyatik** (GISIS reference C0007200), **Lisco Gloria** (GISIS reference C0008391) and **Pearl of Scandinavia** (GISIS reference C0008286), and proposed that the Sub-Committee carefully considers the safety issues identified by the fire on **Commodore Clipper**, together with those contained in the marine accident reports on the ro-ro passenger ships **Lisco Gloria** and **Pearl of Scandinavia**.

4. Following discussions in the Sub-Committee, FSI tasked the Casualty Analysis Correspondence Group to consider all available data on accident reports on ro-ro ferry vehicle deck fires and to provide a conclusion and recommendations on actions to be taken. The Casualty Analysis Correspondence Group reported in FSI 21/5, giving an analysis of available data on ro-ro ferry vehicle deck fires, while paragraphs 60 to 66 provided extracts from some of the casualty reports with a summary of the main findings. Paragraph 67.1 states that:

*“it is requested that the following reports be forwarded to the sub-committees as proposed to note the information provided and take action as appropriate: **Commodore Clipper** to the FP, DE and SLF Sub-Committees; **Lisco Gloria** and **Pearl of Scandinavia** to the FP and DE Sub-Committees. Having considered the information gathered on ro-ro passenger ship fires the group noted that while some of the findings are addressed in legislation, not all of the legislation is applicable to existing ships and some aspects applicable to new ships may need re-examination;”*

5. Indeed, these reports were forwarded to SDC1 (January 2014) and SSE1 (March 2014). SDC1 concluded: *“In considering the above casualties, the Sub-Committee,invited interested Member Governments and international organizations to submit proposals for new outputs to the Committee in accordance with the Guidelines on the organization and method of work”* (SDC1/26, paragraph 24.6). SSE 1 concluded: *“The Sub-Committee, recalling the decision of MSC 92 (MSC 92/26, paragraph 22.29) regarding the approach to be taken in Sub-Committee deliberations on casualty analysis, decided to take no action at this time on the matters forwarded to DE 57 and SSE 1 in the absence of a clear link to existing outputs.”* (SSE1/21, paragraph 20.10).

6. Recent events in 2014 and 2015 have seen two further very serious casualties (Norman Atlantic and Sorrento) where the ships suffered fires originating in the ro-ro deck and resulting in total loss of the ships.

7. In addition to the statistics included in FSI 21/5, in September 2015 EMSA performed an analysis of fires on ro-ro decks as reported in the EMCIP database (European Marine Casualty Information Platform). The result is shown in Figure 1. It should be noted that this database does not reflect the world fleet in total and for this reason the figure includes some additional data points that were drawn from the MARINFO database, which is a platform that gathers data from four commercial data providers.

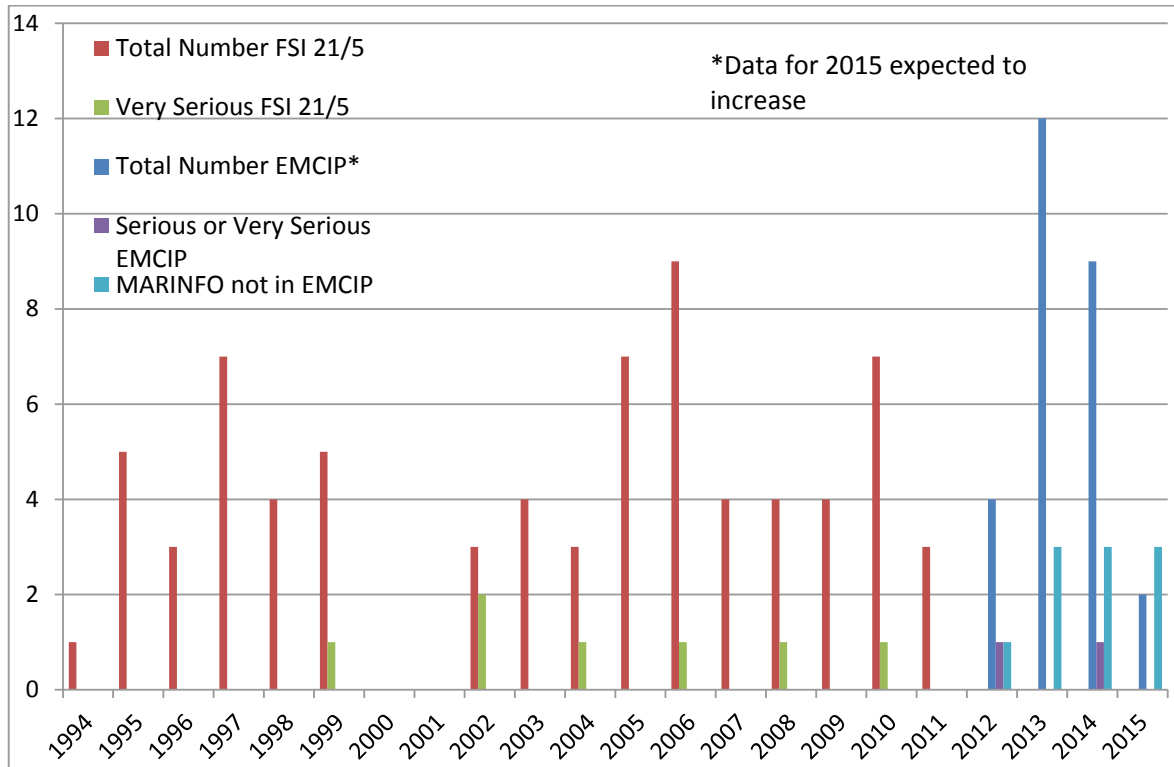


Figure 1 - Fires on ro-ro decks 1994-2015

8. Further to that, in SSE 2/INF.3, Germany presented a study on fire safety in connection with the transport of vehicles connected to the power distribution system of the ship and hybrid or electrically powered vehicles on ro-ro and ro-ro passenger ships, which was then complemented by MSC 96/16/1 (Austria et al.) and MSC 96/INF.3 (Germany) containing some additional information in relation to specific risk mitigation measures. As a result, MSC 96 (MSC 96/25, paragraph 16.12) “invited interested Member States to submit a justification for a new output on Review of SOLAS regulation II-2/20 for consideration at the next session”.

IMO's objectives

9. There are a number of well-reported ro-ro passenger ship casualties, many of which are listed in paragraph 3 of this paper. Consideration of these incidents, as well as the work required under this proposed new output, all relate to IMO objective 5.1 on ensuring that all systems related to enhancing the safety of human life at sea are adequate, including those concerned with large concentrations of people and 5.2 on enhancing technical, operational and safety management standards. In particular, the following sub points are applicable due to the nature of the historical and recent incidents:

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

5.2.2 Development and review of training and watch-keeping standards and operational procedures for maritime personnel.

Compelling need

10. The accidents listed at paragraph 3, as well as other very serious casualties in 2014 and 2015, involve ro-ro ferries, and have already demonstrated the vulnerability of ro-ro ships to fires on their vehicle decks. The severity of such fires, and therefore the ability to manage fire situations, has been highlighted and is of paramount importance for to be considered by the IMO.

11. The severity of fires on ro-ro ships is aggravated by cargo being stowed close together in space, while the existing extinguishing methodologies have been shown to be limited in their effectiveness. Closely parked vehicles, can shield fire sources from fixed water sprays, and limit the potential for a fire team to move around the deck with hoses.

12. New vehicle technologies, such as lithium-ion batteries and fuel cells, exacerbate the fire-fighting issues by increasing the amount of fire hazard in one open space, and by generating high quantities of toxic by-products in the event of a fire.

13. Permanent openings distributed in the side plating may aggravate the spread of ro-ro space fires. These openings may prevent launching of survival craft or other LSA, impeding the evacuation of passengers and crew.

14. The quantity of fire-fighting medium required for fixed fire-fighting systems, such as CO₂ or dry powder, and the need for closing down the space, does not allow their use for smothering fires on open ro-ro vehicle decks. However the alternative existing fire extinguishing systems, such as water mist or water spray, equally have their limitations.

Analysis of the issue

15. The configuration of ro-ro passenger ships provides for a space consisting of a single horizontal fire zone continuing without interruptions for, up to, the full length of the ship. Should a fire on a ro-ro deck either not be extinguished or contained longitudinally, then the integrity of every MVZ (main vertical zone) above the ro-ro space may potentially be compromised.

16. There is evidence to suggest that existing suppression systems may not be capable of extinguishing all fires, particularly those involving commercial vehicles, or in preventing the spread of fire longitudinally. FSI 21/5 stated:

".. there were 14 occasions during which drencher systems were used to combat the fire, seven of which were considered successful deployments – the remaining seven were considered unsuccessful or partially successful."

17. Current A60 boundaries may not prove to be sufficiently robust to prevent the vertical spread of fire, risking the integrity of all fire zones above a ro-ro deck. In this eventuality it is likely that the ship must be abandoned since there is no longer any safe area.

18. In relation to specific ignition risks, FSI 21/5 summary of findings stated:

“...A significant number of the incidents have occurred as a result of electrical fires, particularly relating to refrigerated trailers, but also in some cases from the ship's own equipment.”

In the analysis of fires on ro-ro passenger ships from 1994 to 2011, FSI 21/5 Annex 6 goes on to state:

“...the biggest source of fires has been from reefer containers (20), 12 of which were electrical fires. Electrical fires in vehicles also represent a significant portion of the total.”

19. A ro-ro deck facilitates the accumulation of large quantities of water as a result of water ingress through structural breaches or from the accumulation of fire extinguishing water; this has led to well documented stability problems associated with the free surface effect and, to some extent, these issues have been addressed. However, solutions to fire related issues requiring greater quantities of extinguishing water, and solutions involving boundary cooling of upper decks, may entail further consideration of existing mitigation methods.

20. In light of the vulnerability of all MVZs in the event of an uncontained ro-ro deck fire it is necessary to re-evaluate the adequacy of the casualty threshold and safe area concept in the safe return to port regulations.

21. The transport of hybrid or electric powered vehicles leads to an increased fire hazard. In particular, if the vehicles are connected to the power distribution system of the ship for charging, a higher risk of ignition can be expected. Overall, this leads to a higher risk of fire and thus measures are needed to be taken in order to ensure the ships' safety.

22. Fuel cell vehicles present special risks. When using hydrogen, as it is lighter than air, it can collect under the ceiling of the vehicle deck and may cause a severe explosion with catastrophic consequences for the ship and the persons on board. Leaking hydrogen cannot be detected by the sensors currently in use on ships. The applicable provisions for the prevention of explosions are targeted at gases that are heavier than air and require appropriate explosion protection on vehicle decks only for installations near the floor.

23. In the light of the number of casualties resulting in total loss as a result of failure to suppress, extinguish, contain longitudinally and to contain within A60 boundaries, fires on ro-ro decks, aspects of regulations relating to ro-ro passenger ships need to be re-examined.

24. It is acknowledged that from the analysis new and existing ships may need different risk treatments and implementing measures.

25. Possible areas that should be considered in the analysis include:

- Fire hazards such as fires igniting from vehicle cabs, from reefer units, from vehicle engines, from cargo units in general or from ship's equipment, are common sources of fire ignition on board of ro-ro passenger ships.
- Fire growth mechanisms such as slow and fast growth should be analysed.
- Fire detection; early detection facilitates early and complete extinguishing of undeveloped fires. The effects of wind on fire detection on open ro-ro decks may be considered.

- Fire suppression; effective suppression may buy time for fire extinguishing or permit an orderly evacuation in cases where it is acknowledged that fire extinguishment is unlikely.
- Fire extinguishing; there are instances of failure to extinguish fires despite the proper operation of extinguishing systems. Alternative extinguishing solutions should be sought but given the substantial potential fire load it may have to be accepted that extinguishing may not always be possible once a fire is established; particularly in the case of commercial vehicle fires.
- Fixed fire extinguishing systems their pumping efficiency, sprinklers and drencher requirements. The effects of wind on fire extinguishing on open ro-ro decks may be considered.
- Fire containment longitudinally, within the ro-ro deck; there is evidence that it is not always possible under current arrangements to contain a fire longitudinally.
- Boundary containment; existing A60 boundary containment has not proven to be effective in containing all fires until such time as they are no longer a threat to adjacent fire zones.
- Standards of ship's electrical power supply to cargo/vehicles; this has been identified in FSI 21/5 as a significant source of ro-ro deck fires.
- Carriage of vehicles not powered by diesel or petrol; there is a need to examine the risks associated with alternative vehicle fuels such as fuel cells with vehicles carrying hydrogen, and the available methods of fire detection, suppression, containment and extinguishment should be analysed. This area is particularly critical due to the relatively new technologies being developed for vehicles and the absence of best practise already available to be used as guidance.
- Placing of embarkation and launching areas of Life Saving Appliances (LSA); there have been identified arrangements of LSA leading to equipment being hindered when required for evacuation as a result of proximity to fire, particularly in way of permanent openings distributed in the side plating.
- Casualty threshold and safe area concepts with respect to ro-ro passenger ships.

Analysis of implications

26. A completed Checklist for identifying administrative requirements and burdens is attached at Annex 1. However, because there are no specific proposed actions at this stage, it is not possible to provide evidence of the implications; this will depend on the outcome of the work.

Benefits

27. The work proposed by this paper will present significant benefits to the safety of life at sea by enhancing the standard of safety of ro-ro vessels.

Industry standards

28. There are many technological solutions to the issues presented in this paper but it is possible that the work required under this item will need to include the development of new performance and testing standards for innovative solutions.

Output

29. The output in SMART terms is as follows:

Specific – The intended output is amendments to SOLAS and associated Codes to address the fire safety concerns raised in this paper, by developing measures to reduce the incidence of fires on the vehicle decks of new and existing Ro-Ro passenger ships and to mitigate the consequences of those that do occur.

Measurable – To at least address the issues identified in FSI 21/5 and subsequent casualty investigations.

Achievable – Specific Risk Control Options (RCOs) were already identified in document MSC 96/INF.3 while additional research is scheduled to be carried out by the co-sponsors with EMSA in 2016 and 2017, in order to identify feasible RCOs according to the FSA Guidelines.

Realistic – The already identified RCOs include simple solutions such as extended training for fire-fighting and reviewing the power distribution for vehicles and other best operational practices as suggested by INTERFERRY in MSC 96/6/2. While these elements provide only an indication of some available options, they are evidence that realistic solutions are available also for the issues highlighted in 25.

Time-Bound – It is intended that this will take a maximum of 3 years to complete through the Sub-Committee on Ship Systems and Equipment with support as required from the Sub-Committees on Ship Design and Construction and Human Element, Training and Watchkeeping.

Human element

30. The completed checklist on human element issues contained in MSC-MEPC.7/Circ.1 are included as annex 2.

Priority/urgency and target completion date

31. With direct relevance to the objective of ensuring that all systems related to enhancing the safety of human life at sea are adequate, and noting the significant number of ro-ro casualties reported to FSI 20 and FSI 21, it is believed that this work is of paramount importance.

32. This initiative should be considered by the Organization as soon as possible and be included in the planned High-level Action Plan of the Organization and priorities for the 2016-2017 biennium. The SSE Sub-Committee with the support of the SDC and HTW Sub-committees if needed, is expected to need three sessions to complete its work starting from SSE 4 in 2017.

Action Required

33. It is proposed that the Committee establish a New Unplanned Output on its Work Programme, for action by the Sub-Committee on Ship Systems and Equipment, with support as required from the Sub-Committees on Ship Design and Construction and Human Element, Training and Watchkeeping, with 3 sessions required to complete.

Action requested of the Committee

34. The Committee is invited to consider the information provided above and agree to the request for a New Unplanned Output as proposed.

Annex 1

CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS AND BURDENS

The Checklist for Identifying Administrative Requirements and Burdens should be used when preparing the analysis of implications required of submissions of proposals for inclusion of unplanned outputs.

For the purpose of this analysis, the terms “administrative requirements” and “burdens” are defined as in Resolution A1043(27), i.e. administrative requirements are defined as an obligation arising from future IMO mandatory instruments to provide or retain information or data, and administrative burdens are defined as those administrative requirements that are or have become unnecessary, disproportionate or even obsolete.

Instructions:

- (A) If the answer to any of the questions below is **YES**, the Member State proposing an unplanned output should provide supporting details on whether the burdens are likely to involve start-up and/or ongoing costs. The Member State should also make 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 unplanned output does not contain such an activity, answer **NR** (Not required)

1. Notification and reporting?	NR	Yes
Reporting certain events before or after the event has taken place, e.g. notification of voyage, statistical report for IMO Members, etc.	X	<ul style="list-style-type: none"> • Start-up • Ongoing
Description: (if the answer is yes)		
2. Keeping statutory documents up to date, e.g. records of accidents, records of cargo, records of inspections, records of education, etc.	NR	Yes
	X	<ul style="list-style-type: none"> • Start-up
Description: (if the answer is yes)		
3. Producing documents for third parties, e.g. warning signs, registration displays, publication of results of testing, etc.	NR	Yes
	X	<ul style="list-style-type: none"> • Start-up
Description: (if the answer is yes)		

4. Permits or applications? Applying for and maintaining permission to operate, e.g. certificates, classification society costs, etc.	NR X	Yes • Start-up
Description: (if the answer is yes)		
5. Other identified burdens?	NR X	Yes • Start-up
Description: (if the answer is yes)		

Annex 2
CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES
(MSC-MEPC.7/Circ.1)

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)			
New Unplanned Output on Ch. II-2 of SOLAS			
Responsible Body: (e.g. Committee, Sub-committee, Working Group, Correspondence Group, Member State)			
SDC, SSE and HTW Note – all responses are marked as not applicable because no specific outputs are proposed so an analysis of human element cannot be conducted. However, it is foreseen that solutions related to human element issues will be considered.			
1.	Was the human element considered during development or amendment process related to this subject?	Yes	No ✓ NA
2.	Has input from seafarers or their proxies been solicited?	Yes	No ✓ NA
3.	Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)	Yes	No ✓ NA

4.	Have human element solutions been made as an alternative and/or in conjunction with technical solutions?	Yes	No	✓	NA
5.	Has human element guidance on the application and/or implementation of the proposed solution been provided for the following:	Yes	No	✓	NA
	• Administrations?	Yes	No	✓	NA
	• Ship owners/managers?	Yes	No	✓	NA
	• Seafarers?	Yes	No	✓	NA
	• Surveyors?	Yes	No	✓	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?	Yes	No	✓	NA
7.	Does the solution address safeguards to avoid single person errors?	Yes	No	✓	NA
8.	Does the solution address safeguards to avoid organizational errors?	Yes	No	✓	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?	Yes	No	✓	NA
10.	Have human element experts been consulted in development of the solution?	Yes	No	✓	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.	Yes	No	✓	NA
<input type="checkbox"/>	PERSONNEL. The necessary knowledge, skills, abilities, and experience levels that are needed to properly perform job tasks.	Yes	No	✓	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 performance	Yes	No	✓	NA

<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc. to properly manage risks.	Yes No ✓ 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.	Yes No ✓ 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.	Yes No ✓ NA
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive, and sensory abilities of the user population.	Yes No ✓ NA

Comments:

- (1) Justification if answers are NO or Not Applicable.
No existing instruments cover the aims of the proposal.

Guidance is planned to supplement the proposed amended regulation.

Being a new proposal, it is not mature to involve human element experts at this stage.
- (2) Recommendations for additional human element assessment needed. - To be performed by the HTW Sub-Committee.
- (3) Key risk management strategies employed. - None
- (4) Other comments. - None
- (5) Supporting documentation. – None

Annex 3

CHECK/MONITORING SHEET FOR THE PROCESS OF AMENDMENTS TO THE CONVENTION AND RELATED MANDATORY INSTRUMENTS

(PROPOSAL / DEVELOPMENT)

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

2	<i>Submitted by (Document Number and submitter)</i> [MSC 97/19/X]
3	<i>Meeting session</i> MSC 97
4	<i>Date (date of the submission)</i>

Part II – Details of the 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> 5.2.1
2	<i>Planned output</i> Amendment of SOLAS
3	<i>Recommended type of amendments (MSC.1/Circ.1481) (delete as appropriate)</i> Four-year cycle of entry into force
4	<i>Intended instrument(s) to be amended (SOLAS,)</i> SOLAS
5	<i>Intended application (scope, size, type, tonnage/length restriction, service (International/non-international), activity, etc.)</i> The proposed amended regulation should involve all
6	<i>Application to new/existing ships (i.e. if intended to be a retro-active application)</i>
7	<i>Proposed coordinating sub-committee</i> Sub-Committees on Ship Systems and Equipment (SSE)

8	<i>Anticipated supporting sub-committees</i>
	Ship Design and Construction (SDC)and Human Element, Training and Watchkeeping (HTW)
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>