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**COMMISSION STAFF WORKING DOCUMENT**

**Union submission to the 104<sup>th</sup> session of the International Maritime Organization's  
Maritime Safety Committee proposing to regulate remote survey and audit**

## **Union submission to the 104<sup>th</sup> session of the International Maritime Organization's Maritime Safety Committee proposing a new output to regulate remote survey and audit**

### **PURPOSE**

This Staff Working Document contains a draft Union submission to the International Maritime Organization's (IMO) 104<sup>th</sup> session of the Maritime Safety Committee (MSC 104). The IMO has indicatively scheduled MSC 104 from 4 to 8 October 2021.

The draft submission proposes a new output for regulating remote surveys and audits. The issue of remote inspections and audits of ships arose during the COVID-19 pandemic. In reaction, the IMO secretariat promoted a practical and pragmatic approach highlighting the importance of continuing to conduct classification and statutory surveys during the pandemic. The IMO secretariat also stressed that flag State administrations may grant extension of the period of validity of certificates for three months.

Several flag State administrations have recourse to the remote inspection and audit in lieu of physical onboard survey or audit, especially when the surveyor cannot attend physically the ship. Yet there are no agreed provisions or common procedures to date at international level for the execution of class and statutory surveys or audits by remote means.

This shows that there is an urgent need to develop specific guidance to ensure that this practice is carried out in a harmonised way, maintaining the level playing field. In this regard, it is essential that standards for remote surveys and audits ensure they provide the same level of safety as that provided by a physical onboard survey. In the absence of provisions enabling the use of remote inspection techniques, remote surveys and audits should be mainly used in force majeure situations.

### **EU COMPETENCE**

Regulation (EC) No 391/2009<sup>1</sup> lays down common rules and standards for ship inspection and survey organisations. Point A.3 of Annex I to the Regulation requires that the Recognised Organisations have the necessary technical and human resources to deliver their work while point B.1 requires that they maintain a worldwide network of exclusive surveyors.

In addition, point B.7(k) of Annex I to the Regulation makes HSSC Guidelines mandatory for a recognised organisation. Furthermore, Regulation (EC) No 336/2006<sup>2</sup> incorporates the International Safety Management Code (ISM Code) in the Union's legal order.

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<sup>1</sup> Regulation (EC) No 391/2009 of the European Parliament and of the Council of 23 April 2009 on common rules and standards for ship inspection and survey organisations, OJ L 131, 28.5.2009, p. 11

<sup>2</sup> Regulation (EC) No 336/2006 of the European Parliament and of the Council of 15 February 2006 on the implementation of the International Safety Management Code within the Community and repealing Council Regulation (EC) No 3051/95, OJ L 64, 4.3.2006, p. 1–36

In light of all of the above, the present draft Union submission falls under EU exclusive competence.<sup>3</sup> This Staff Working Document is presented to establish an EU position on the matter and to transmit the document to the IMO prior to the required deadline of 2 July 2021.<sup>4</sup>

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<sup>3</sup> An EU position under Article 218(9) TFEU is to be established in due time should the IMO Maritime Safety Committee eventually be called upon to adopt an act having legal effects as regards the subject matter of the said draft Union submission. The concept of '*acts having legal effects*' includes acts that have legal effects by virtue of the rules of international law governing the body in question. It also includes instruments that do not have a binding effect under international law, but that are '*capable of decisively influencing the content of the legislation adopted by the EU legislature*' (Case C-399/12 Germany v Council (OIV), ECLI:EU:C:2014:2258, paragraphs 61-64).

<sup>4</sup> 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.

## WORK PROGRAMME

### Proposal for regulating remote survey and audit

Submitted by the European Commission on behalf of the European Union

#### SUMMARY

*Executive summary:* This document proposes a new output to be considered by the III Sub-Committee and HTW Sub-Committee on the need to provide guidance on remote survey and remote International Safety Management audit by way of either a dedicated guidance or, preferably, amendment of the Survey Guidelines under the Harmonized System of Survey and Certification (HSSC) and guidance for the International Safety Management Code (ISM Code) as well as the development of a framework on how they should be carried out.

*Strategic Direction, if applicable:* 1 and 6

*Output:* Not applicable

*Action to be taken:* Paragraph 40

*Related documents:* MSC 102/22/11, MSC 102/24, SDC 7/10, SDC 7/16, Circular Letter No.4204/Add.6, IMO Circular Letter No.4204/Add.16, Circular Letter No.4204/Add.19/Rev.3, Res.A.1140(31), Res.A.1111(30), Res.A.1118(30).

#### Introduction

1 This document is submitted in accordance with paragraphs 4.6 and 6.12.2 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.2), taking into account the Application of the Strategic Plan of the Organization (resolution A.1111 (30)).

2 The Subcommittee on Ship Design and Construction, at its 7<sup>th</sup> session, discussed document SDC 7/10 (IACS) proposing amendments to the 2011 ESP Code, allowing for the use of remote inspection techniques. While the use of RITs for surveys under the 2011 ESP Code had been generally supported, SDC 7 decided that the matter required a broader

consideration by the Organization, which might consider taking a holistic approach in regulating RITs, including those that might be considered under other instruments (SDC 7/16 paragraph 10.3).

3 The Maritime Safety Committee, at its 102<sup>nd</sup> session, when considering document MSC 102/22/11 (Republic of Korea), proposing the development of guidance on the implementation of remote surveys, recognised that such work would require detailed technical consideration by experts and should also include matters related to cases of force majeure. The Committee invited interested Member States and international organisations to submit a new output proposal to the Committee, in accordance with the Committees' method of work (MSC-MEPC.1/Circ.5/Rev.1) (MSC 102/24 paragraph 22.20).

### **IMO objectives**

4 This proposal is in line with IMO's mission statement of promoting safe, secure and environmentally sound, efficient and sustainable shipping.

5 This submission is also consistent with IMO's strategic direction (SD) 1 aiming at the effective, efficient and consistent implementation and enforcement of the provisions of the IMO instruments, and with IMO's strategic direction (SD) 6 which aims to ensure that a universally adopted, effective, international regulatory framework is in place and implemented consistently, embracing and integrating new and advancing technologies, without causing unnecessary burdens.

### **Need**

6 During the COVID-19 pandemic the IMO promoted a practical and pragmatic approach highlighting the importance of undertaking classification and statutory surveys and the possibility of flag State administrations granting extension of the period of validity of certificates for three months (IMO Circular Letter No.4204/Add.6).

7 The IMO supported industry-developed 'Covid-19-related guidelines for ensuring a safe shipboard interface between ship and shore-based personnel' (IMO Circular Letter No.4204/Add.16) indicating that one safety control measure to reduce risk could be to conduct audits, surveys, inspections and training remotely.

8 The IMO published 'Guiding principles for the provision of technical and implementation advice to flag States when considering whether to permit statutory certificate extension beyond 3 months' (IMO Circular Letter No.4204/Add.19/Rev.3) indicating step-based approach to issuing short-term certificates or extending certificates beyond the statutory maximum in cases when the physical surveys could not be carried out.

9 Several flag State administrations accepted the remote inspection and audit in lieu of the onboard survey/audit, when the recognised organisation (RO) proposed that said survey/audit could be carried out remotely utilising RO specified processes. However, to date, there are no provisions or common procedures agreed at the international level for the execution of class and statutory surveys/audits by remote means, i.e. without attendance by surveyor(s)/auditor(s).

10 There is an urgent need to develop specific guidance to ensure that this practice of remote survey is carried out in a harmonised way and in a manner that ensures the same level of safety as that provided by a physical onboard survey. The methodology of remote surveys and audits, be they a complete or partial substitute to physical attendance, should be properly assessed based on an international recognised method.

11 At present remote surveys and audits are predominantly used during extraordinary circumstances (such as the current pandemic or other cases like natural disasters, warfare, etc.). Availability of properly assessed and accepted by a flag State remote survey methods would facilitate acceptance of results of those remote surveys and audits performed under normal circumstances.

12 Under both circumstances, the quality of remote survey/audit and the level of safety on board should not be compromised and such surveys/audits should provide the same confidence in this respect as the ones performed by the physical presence of surveyors or auditors. A discussion and determination is needed to ascertain if remote surveys of all or some survey items could be considered appropriate or that physical attendance to complete the scheduled surveys under the HSSC Guidelines would be necessary.

### **Analysis of the issue**

13 During the pandemic, several flag Administrations have authorised the use of remote surveys and audits by their ROs. As indicated in MSC 102/22/11 (Republic of Korea), it appears that each RO has its own procedures to follow, and that only a few flag States explicitly allow or mention the conduct of remote surveys in their survey guidelines. Generally, there are no detailed technical instructions provided in such guidelines and the scope and procedures vary from one flag State to another. Development of specific guidance, as mentioned in paragraph 10, would help to create a level playing field on the par with the survey guidelines under the Harmonised System of Survey and Certification (HSSC) or guidelines on implementation of the ISM Code.

14 In fact, a recent monitoring exercise regarding European Recognised Organisations' (EU ROs') activities, carried out by the European Maritime Safety Agency (EMSA), indicated that the ROs did not have harmonised procedures, leading to differences in approaches to the procedures for the remote classification and statutory surveys.

15 Until recently, surveys or audits performed without the physical attendance of a surveyor/auditor have been mostly limited to extraordinary cases for postponement of surveys or audits or in cases where the scope did not require any substantial on-site verification. It is generally considered that the present legal framework has been developed on the underlying principle that the surveys are to be carried out with the on-board presence of the surveyors/auditors. A dedicated assessment to determine that normal survey practices with the attendance of a surveyor on-board can be replaced by remote means would be needed.

16 The COVID-19 situation may catalyse a wider use of remote surveys/audits, requiring action from IMO to demonstrate that the main safety and quality elements of the present regime are upheld when such remote surveys and audits are used. Also, there is an urgent need to ensure that such practices do not constitute undue burden to shipowners and ship crew when they are implemented.

17 In developing the necessary guidance it is essential to define what could be considered as remote survey and distinguish it from the definition of remote inspection techniques. Remote inspection techniques (RIT) are described in IACS Rec No 42 'Guidelines for Use of Remote Inspection Techniques for surveys' and defined in IACS UR Z17 'Procedural Requirements for Service Suppliers' as a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor. In a wider context this definition may be extended to an inspection carried out by a qualified technician of an approved service supplier (except if performed directly by the surveyor) and in the presence of the surveyor.

18 The use of RIT has the potential on enhancing safety by providing the possibility of inspecting areas that otherwise would be difficult to reach. RIT can also partly replace the physical inspections in confined spaces or at height thus reducing the risks of accidents during these inspections. The current IACS guideline for RIT is general in nature and is not sufficiently detailed to ensure consistent application. IACS member societies have individually developed detailed guidelines for implementation of RIT that fall within the general guidance of the IACS recommendation. An IMO guideline on RIT would need to be at least as detailed as those procedures used by an individual class society.

19 Remote surveys, on the other hand, are not defined in any international instrument, but by analogy to the above it could be defined as a means of survey that enables examination of a ship's hull structure, machinery component or equipment and/or gathering information and evidence of compliance with applicable requirements without the physical attendance of the surveyor. In a similar manner remote audit is not defined. In the past some portion of an audit may be carried out via document review in advance of an actual on site visit. However, interviewing crew members and viewing records that are maintained onboard has required the physical presence of the auditor. Some aspects of the audit such as interviews of crew may lend themselves to basic video conference technology but document viewing and sharing may not be as readily accomplished. Audits, though not surveys, typically include a walk around the vessel to view its general condition and implementation of safety management system procedures.

20 In a remote survey, generally, survey items to examine the condition of the ship or equipment encompass physical inspections performed by the crew or by a qualified technician from an approved service supplier under the remote surveillance and instructions of the surveyor by two-way audio and video communication or other means of communication. The evaluation and acceptance of the condition of the survey item remains under the sole responsibility of the surveyor.

21 Survey items surveyed remotely in preparation and in combination with the surveys on board may optimize the efficiency of the surveys, as an example it may reduce the time spent reviewing records on board. The introduction of remote surveys may be also a driver to improve the communication channels between the ship and shore that by itself may enhance the safety of the ship. It makes also possible to get the right expertise opinion with direct information on the item inspected as it might be valuable in certain cases.

22 However to safeguard the safety level of the current regime the presence of the surveyor/auditor on board should always be required to complete survey/audit items that could not be performed remotely. Additionally, the surveyor may, if deemed necessary, confirm the results of specific surveys/ audit items.

23 Remote audits are not foreseen in the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) and IMO Resolution A.1118(30) 'Revised guidelines on the implementation of the International Safety Management (ISM) Code by Administrations'. However, there are existing international standards for the use of remote auditing methods (ISO 19011:2018 'Guidelines for auditing management systems', IAF ID 12:2015 'Principles on Remote Assessment', IAF MD 4:2018 'IAF Mandatory document for the use of information and communication technology (ICT) for auditing / assessment purposes') that could be adopted accordingly, as a temporary solution.

24 The use of remote audit methods for ISM audits would require to consider and implement such existing standards in the current practices only to these audit activities where this approach would be found adequate. While remote audits may not be able to replace in full the observations by the auditor of condition and implementation of safety management system procedures including activities on-board that are an essential part of the safety

management audits on board ships, determination of the extent of their application is needed.

### **Handling of remote surveys and audits under extraordinary circumstances**

25 It is recognized that under extraordinary circumstances such as the ones provoked by the current COVID-19 pandemic, the use of remote surveys may simply be employed to consider alternative evidence on the condition of the ship in lieu of completing the physical survey for the purpose of a postponement or for verification of rectification of minor deficiencies identified in previous surveys. These remote surveys/audits may be accepted on a 'case by case' basis, provided that an assessment is carried out and that the result of the remote survey is validated by a physically attended survey at the first opportunity when necessary.

26 This 'case-by-case' assessment should as a minimum address considerations such as:

- the safety performance of the safety management of the ship;
- the detailed and documented justification for the use of remote surveys/audit (e.g. extraordinary circumstances and/or force majeure situations such as warfare, pandemics or natural disasters that do not allow physical attendance of a surveyor on board the vessel);
- the scope of remote surveys/audits (e.g. survey planning, survey items that could be done remotely, type of ship and equipment, harmonisation of requirements between ROs, ...);
- the consultation with the flag State in case the survey/audit has been delegated to an RO (e.g. coordination of surveys and full responsibility for the outputs, ...);
- the technical requirements for the use of remote survey/audit (use of approved remote inspection techniques, audio and video communication, two-way communication, ...);
- the need of a validation by a physically attended survey at the first opportunity
- the roles, responsibility, impartiality and liability of the involved parties, including personnel involved in physical inspection on board ship (e.g. tests, examinations, gathering of evidence on the condition of the ship);
- the qualifications of personnel involved in physical inspection on board ship;
- the provision of information and evidence to the surveyor/auditor (audio and video records, confidentiality of information, ...);
- the reporting requirements and records (master statement, survey report, service suppliers' report, ...);
- the transparency of information.

### **Handling of remote surveys and audits under normal circumstances**

27 Under normal circumstances, for surveys or audits other than the initial or renewal consideration may be given to the use of remote survey or audit for specified items only after an assessment by the flag Administration to ensure that the same safety level as that of on-site surveys with the physical attendance of the surveyor is achieved and taking into account the points described in paragraph 26. Such remote surveys/audits shall be completed by on site visit for the verification of the items that could not be verified remotely. Additionally, the surveyor may, if deemed necessary, confirm the results of specific surveys/ audit items.

28 As precautionary measure initial and renewal surveys at this stage shall be excluded considering the scope and the importance of these surveys before the ship is put into service and at the renewal interval, so that all survey items are inspected physically at reasonable intervals.

29 However currently there is no internationally accepted way to assess or prove that remote surveys' or audits' items surveyed remotely may achieve the same safety level and



confidence as that from physical attendance. Moreover, conducting remotely the surveys and audits required by the relevant IMO instruments as described in the conventions and Guidelines is not regulated, so the current legal framework will need to be considered.

### **Analysis of implications**

30 There are no additional administrative burdens for the Administrations. The checklist for identifying administrative requirements and burdens (MSC-MEPC.1/Circ.5/Rev.2) is set out in annex 1.

### **Benefits**

31 The proposed new output aims to ensure that remote surveys/audits performed under extraordinary circumstances or under normal circumstances as are contemplated in paragraph 25, provide a satisfactory degree of assurance as the originally prescribed "intent" of the measures in the IMO conventions.

32 The proposal also intends that the confidence and credibility of the current survey/audit regime is maintained, as the fundamental vehicle to confirm that the ships are designed, constructed, maintained and managed in compliance with the requirements of IMO conventions, codes and other instruments while safeguarding a level playing field among the flag State administrations and a high level of safety.

### **Industry standards**

33 There are no provisions or common procedures agreed for the execution of class and statutory surveys or audits by remote means, i.e. without attendance by surveyor(s)/auditor(s).

34 The only existing industry standard is that related to remote inspection/auditing techniques:

- IACS Rec.42 'Guidelines for Use of Remote Inspection Techniques for surveys'
- ISO 19011:2018 'Guidelines for auditing management systems';
- IAF ID 12:2015 'Principles on Remote Assessment';
- IAF MD 4:2018 'IAF Mandatory document for the use of information and communication technology (ICT) for auditing / assessment purposes'.

### **Output**

35 The proposed output should consider when remote surveys or audit items surveyed or audited remotely could be allowed as well as under which conditions they should be conducted. For surveys this output could involve development of separate guidelines or, preferably, amendments to the Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), as well as the development of guidance on how to assess remote surveys methods by the flag administration. For ISM audits the output would be additional guidance to the ISM Code in the form of a revision to A1118(30) or other guidance document appended to the ISM Code in the form of an MSC-MEPC Circular.

36 The work for survey should be entrusted to the Sub-Committee on Implementation of IMO Instruments (III). The work for remote ISM audit should be entrusted to the Sub-Committee on Human Element, Training and Watch standing (HTW). Although survey and audit are distinct activities they are complementary processes which support sustained compliance with safety and environmental standards. Coordination between the two sub-committees on this project is essential and encouraged especially regarding the use of terminology as well the capabilities of remote technology platforms.

## **Human element**

37 The completed checklist contained in the Checklist for considering human element issues by IMO bodies (MSC-MEPC.7/Circ.1) is set out in annex 2.

## **Urgency**

38 Remote survey activities are already being conducted due to the situation created by the COVID-19 pandemic, without a harmonized framework that ensures that the safety level provided by the current survey regime is maintained. Without such safeguard, there is a risk of losing the credibility and confidence of the existing statutory regime of which surveys are a fundamental element.

39 It is envisaged that this output could be completed in two sessions of the Sub-Committee, starting from the upcoming eight session of the Sub-Committee (III 8).

## **Action required**

40 The Committee is invited to consider the information provided above and approve the request for a new output on the development of guidance for conducting remote surveys/audits under defined circumstances, by either developing a stand alone guidance or, preferably, amending the Survey Guidelines under the Harmonized System of Survey and Certification (HSSC) and including the development of guidance to the administrations for assessment of remote survey/audit methods. The subject of remote survey is most appropriately assigned to the III Sub-Committee. The ISM Code is within the scope of the HTW Sub-Committee and as such assignment of remote audit is appropriately assigned to HTW. As noted in paragraph 36 coordination with III will be essential. Prior to commencement of work by HTW it is recommended that the subcommittee solicit existing remote audit policies and procedures developed during the pandemic from flag administrations and ROs to form a basis for creating consolidated IMO guidance.

## 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 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.

**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 .	<b>NR</b>	
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.	<b>NR</b>	
Description of administrative requirement(s) and method of fulfilling it:(if the answer is yes)		
The existing record keeping is anticipated to continue. The proposal to encourage facilitating reporting results from inspections carried out by non-governmental entities seeks to mitigate any additional burden on Administrations.		
3. Publication and documentation? Producing documents for third parties, e.g. warning signs, registration displays, publication of results of testing	<b>NR</b>	
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	<b>NR</b>	
Description of administrative requirement(s) and method of fulfilling it:(if the answer is yes)		
5. Other identified requirements?	<b>NR</b>	

## ANNEX 2

### CHECKLIST FOR CONSIDERING HUMAN ELEMENT ISSUES BY IMO BODIES

<b>Instructions:</b>			
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.			
<b>Subject Being Assessed:</b> (e.g. Resolution, Instrument, Circular being considered)			
New unplanned output to consider when and how remote surveys could be conducted			
<b>Responsible Body:</b> (e.g. Committee, Sub-committee, Working Group, Correspondence Group, Member State)			
Maritime Safety Committee and the Sub-Committee for on Implementation of IMO Instruments (III)			
1. Was the human element considered during development or amendment process related to this subject?		Yes	
2. Has input from seafarers or their proxies been solicited?		No	
3. Are the solutions proposed for the subject in agreement with existing instruments? (Identify instruments considered in comments section)		Yes	
4. Have human element solutions been made as an alternative and/or in conjunction with technical solutions?		Yes	
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		
• Ship owners/managers?		No	
• Seafarers?		No	
• Surveyors?	Yes		
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	
7. Does the solution address safeguards to avoid single person errors?		Yes	
8. Does the solution address safeguards to avoid organizational errors?		Yes	
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?			NA
10. Have human element experts been consulted in development of the solution?		Yes	

<b>11. HUMAN ELEMENT: Has the proposal been assessed against each of the factors below?</b>	
<input type="checkbox"/> CREWING. The number of qualified personnel required and available to safely operate, maintain, support, and provide training for system.	NA
<input type="checkbox"/> PERSONNEL. The necessary knowledge, skills, abilities, and experience levels that are needed to properly perform job tasks.	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
<input type="checkbox"/> OCCUPATIONAL HEALTH AND SAFETY. The management systems, programmes, procedures, policies, training, documentation, equipment, etc. to properly manage risks.	Yes
<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
<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
<input type="checkbox"/> HUMAN FACTORS ENGINEERING. Human-system interface to be consistent with the physical, cognitive, and sensory abilities of the user population.	Yes