Council of the European Union

Brussels, 13 March 2025
(OR. en)

7084/25

LIMITE

MAR 39
OMI 22

COVER NOTE

From:	Secretary-General of the European Commission, signed by Ms Martine DEPREZ, Director
date of receipt:	28 February 2025
To:	Ms Thérèse BLANCHET, Secretary-General of the Council of the European Union
No. Cion doc.:	SWD(2025) 62 final
Subject:	COMMISSION STAFF WORKING DOCUMENT Union submission to 110th session of IMO's Maritime Safety Committee proposing a new output to amend SOLAS regulation II-2/4 and relevant recommendations to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes

Delegations will find attached document SWD(2025) 62 final.

Encl.: SWD(2025) 62 final

EUROPEAN
COMMISSION

Brussels, 28.2.2025
SWD(2025) 62 final

COMMISSION STAFF WORKING DOCUMENT

Union submission to 110th session of IMO's Maritime Safety Committee proposing a new output to amend SOLAS regulation II-2/4 and relevant recommendations to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes

Union submission to the 110th session of the International Maritime Organization's Maritime Safety Committee proposing a new output to amend SOLAS regulation II-2/4 and relevant recommendations to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes

PURPOSE

This Staff Working Document contains a draft submission to the International Maritime Organization's (IMO) 110th Maritime Safety Committee (MSC 110). The IMO has scheduled MSC 110 from 18 to 27 June 2025.

The draft submission proposes a new output to amend SOLAS regulation II-2/4 and relevant recommendations (MSC.1/Circ.1321) in respect of arrangements for oil fuel, lubrication oil and other flammable oils to reduce the possibility of engine room fires originated from leakages in low-pressure fuel pipes and lubrication oil pipes.

This submission has been prepared by the International Association of Classification Societies (IACS) and the International Union of Marine Insurance (IUMI) and the EU Member States and the European Commission have been asked to co-sponsor it.

EU COMPETENCE

Article 6(2)(a)(i) of Directive 2009/45/EC on safety rules and standards for passenger ships[1] provides that new passenger ships of Class A engaged in domestic voyages within the EU shall comply entirely with the requirements of the 1974 SOLAS Convention, as amended. Therefore, any changes to SOLAS regulations would affect Union common rules set out in the Directive.

In light of all of the above, the present draft Union submission falls under EU exclusive competence, pursuant to article 3(2) TFEU, as the new output suggests the amendment of SOLAS regulation II-2/4, which once adopted, risks affecting or altering Union legislation and in particular Directive 2009/45/EC.[2] 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 14 March 2025.

[1] OJ L 163, 25.6.2009, p. 1

[2] 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). The present submission, however, does not produce legal effects and thus the procedure for Article 218(9) TFEU is not applied.

MARITIME SAFETY COMMITTEE
110th session
Agenda item

MSC 110/XX/XX
March 2025
Original: ENGLISH
Pre-session public release: ☒

WORK PROGRAMME

New output proposal to amend SOLAS regulation II-2/4 and relevant recommendations (MSC.1/Circ.1321) to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes

Submitted by Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands (Kingdom of the), Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the European Commission, acting jointly in the interest of the European Union, and IACS and IUMI

SUMMARY

Executive summary:	This document proposes a new output to amend SOLAS regulation II-2/4 and relevant recommendations (MSC.1/Circ.1321) in respect of arrangements for oil fuel, lubrication oil and other flammable oils to reduce the possibility of engine room fires originated from leakages in low-pressure fuel pipes and lubrication oil pipes.
Strategic direction, if applicable:	7
Output:	Not applicable
Action to be taken:	Paragraph 26
Related documents:	MSC 79/20/3; MSC 79/INF.9; MSC 79/23 (paragraph 20.11)

Introduction

1 This document is submitted in accordance with the provisions of the *Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.5/Rev.5) on the submission of proposals for new outputs and proposes to amend SOLAS regulation II-2/4 in respect of arrangements of oil fuel, lubrication oil and other flammable oils piping and relevant recommendations (MSC.1/Circ.1321) with a view to enhancing the safety of ships concerning low pressure fuel piping system and reducing the possibility of engine room fires originated from low-pressure fuel pipes and lubrication oil pipes leakages.

Background

2 The Maritime Safety Committee, at its seventy-ninth session, having considered documents MSC 79/20/3 and MSC 79/INF.9 submitted by the Republic of Korea, recognized the need for the development of practical guidelines providing a set of measures to minimize the possibility of fires in the engines-rooms and cargo pump-rooms taking into account relevant IMO instruments and present engineering and shipbuilding technology, and agreed

to include in the Fire Protection (FP) Sub-Committee's work program, a high priority item on "Measures to prevent fires in engine rooms and cargo pump-rooms", with four sessions needed to complete the item (MSC 79/23, paragraph 20.11)

3 The Maritime Safety Committee, at its eighty-sixth session, having considered a proposal by FP 53, approved the Guidelines for measures to prevent fires in engine-rooms and cargo pump-rooms (MSC.1/Circ.1321).

4 In 2017, Cefor (the Nordic Association of Marine Insurers) initiated a project within its Technical Forum focusing on the increased numbers of reported fires in engine rooms due to leakage from low-pressure fuel and lubrication oil pipes.

5 In May 2017, the Cefor Technical Forum started a dialogue with IACS and IUMI related to such fire risks. This dialogue continued with annual meetings with IACS-IUMI, where the Norwegian Hull Club (a member of the Cefor Technical Forum) presented the results of their case study on behalf of Cefor/IUMI. The subject was discussed in October 2019 at the Tripartite 2019 meeting in Tokyo, Japan, where IACS presented the subject of fire risks due to leakages from low-pressure fuel pipes. These activities have led to the establishment of an IACS-IUMI Correspondence Group to cooperate on identifying and developing practicable measures to reduce the risk of fires in the engine room caused by the spray of fuel and lubricating oil onto hot surfaces, in which agreed on the need to revise SOLAS regulation II-2/4.

IMO's objectives

6 The co-sponsors consider that this proposal for a new output to amend SOLAS regulation II-2/4 regarding arrangement for oil fuel, lubrication oil and other flammable oils is in line with the IMO's mission statement of promoting safe, secure and environmentally sound, efficient and sustainable shipping. This lies within the IMO strategic direction SD7 "Ensure regulatory effectiveness".

Need

7 Cefor statistics show that from 2008 to 1Q 2023 there were one hundred and thirty-seven (137) incidents and accident reports of engine room fires. In one hundred and nine (109) of these incidents, a gross repair cost of more than $0.51 billion has been registered. Most of these cases were identified to have oil fuel, lubricating oil, thermal oil, etc. involved, and about 60% of them started with a fuel or oil leaking and/or spraying onto hot surfaces (please refer to tables 1, 2 and 3 below). From the analysis on these incidents, the co-sponsors conclude that fires caused by leakage from high-pressure fuel pipes are under control, due to the double wall piping arrangement and fuel leakage detection system arrangement. However, any defect or damage in low pressure piping systems may cause a safety hazard because oil flow continues for as long as the fuel or lubricating oil pump is running; this acts as a continuous supply of "fuel to the fire" even after the engine (that is supposed to receive the fuel) has stopped (due to the lack of the fuel). Study of these cases led to the consideration of the need to develop practicable and feasible measures to reduce the possibility of leakage and/or spraying from low pressure oil fuel and lubricating oil piping onto hot surfaces, which would help mitigate the risk of fires in the engine room.

Year:	Number of Incidents:
2008-2011	13
2012-2015	35
2016-2019	26
2020-1Q2023	63

Table 1: Incident period

Medium:	Number of Incidents:
MDC/HFO	31
HFO	52
Lubricating Oil	19
Thermal Oil	8
Unknown	27

Table 2: Medium involved

Root Cause:	Number of Incidents:
Pipe connection failure – wrong tightening/torque	17
Loose flange/studs to HP pumps including foundation	10
Vibration – insufficient pipe support, resulting fatigue	15
Loose pipe flange – burst sealing	11
Pipe welding crack (flange/connection welding)	12
Modification of pipe system (crew)	11
Flexible hoses including connections	4
Overflow	2
Unknown	55

Table 3: Root causes

8 Other findings have led to consider such a measure as isolating different gauges and instrumentations, e.g. sensors to monitor pressure, temperature, flow or other parameters, by fitting an isolating valve at their connection to the oil fuel and lubricating oil systems, so that any leakage or spraying from a damaged or ill-fitted gauge or instrumentation can be easily and promptly stopped by shutting down the isolating valve.

9 In addition to the above measure, the co-sponsors understand that relating guidelines in MSC.1/Circ.1321 can be used as a good reference to generate practicable and feasible measures which could be further developed as amendments to SOLAS regulation II-2/4 introducing additional requirements for low-pressure oil fuel and lubricating oil systems to reduce the possibility of leakage and/or spraying onto hot surfaces and electrical installations.

Analysis of the issue

10 SOLAS regulation II-2/4 provides requirements relating to the design, construction, and arrangement of oil fuel and lubricating oil systems, whilst MSC.1/Circ.1321 gives guidelines on the piping arrangement and protection.

11 From studies of the fires reported to Cefor, it is concluded that the requirements in SOLAS regulation II-2/4, as well as provisions in guidelines contained in MSC.1/Circ.1321, are not always fully followed or implemented on board. The deficiencies discovered concern the actual arrangements on board and the human element, and are presented in the following paragraphs 12 and 13,.

12 Deficiencies pertaining to the actual arrangement onboard were as follows:

.1 some shielding methods were proven to provide insufficient protection against spray onto hot surfaces due to poor design and quality, deterioration, as well as wear and tear over time;

.2 the fuel oil return line was pulled out and disconnected (by crew or vibration) and the fuel oil leak detection system was not working;

.3 the gasket at the lubricating oil pipe joint was partially fractured and a section of it had been displaced producing a gap where lubricating oil could have escaped;

.4 the fuel oil spray from duplex filter;

.5 the loose flange connection (with only two bolts on position);

.6 the fuel oil tank which was located above main engine exhaust ducts with damaged/missing insulation; fuel oil leakage dripping directly on to the exhaust ducts;

.7 poor piping arrangement which was easily subjected to mechanical damage;

.8 the lack of shielding/protection of pipes and hoses;

.9 the lack of pipe supports;

.10 missing or damaged spray insulation tape;

.11 bad interface between main engine and different oil systems;

.12 poor or no insulation of hot surfaces, for example, exhaust ducts;

.13 small space for inspection and maintenance.

13 Deficiencies related to human element were as follows:

.1 poor installation and maintenance;

.2 crew fatigue after long periods of working.

14 From the above studies and analysis, the co-sponsors believe that the measures listed in paragraphs 15 and 16 concerning arrangements on board and human element could reduce the possibility of leakage and/or spray from low-pressure oil fuel and lubricating oil system.

15 Measures related to the arrangements on board are as follows:

.1 the improved design of the connection between the main engine and different oil systems;

.2 the improved shielding, including design and material;

.3 the improved design of hot surface insulation (to be covered with metal sheeting) not allowing oil seeping;

.4 the improved installation of gauges and instruments with the isolating valve at the connection to oil systems;

.5 the improved design to locate filters and strainer at safe places with suitable protection and easy maintenance;

.6 the improved installation procedure and tools, ensuring accurate tightening torques and forces to avoid possible damage to bolts or other connections;

.7 the improved design and construction of the joint spray shield.

16 Measures related to the human element are as follows:

.1 highlighting the importance of the ship operator's involvement in the daily operations and maintenance of the ship;

.2 the improved maintenance by crew;

.3 the improved daily inspection and checking by crew;

.4 providing the improved knowledge and training to crew on proper operation, routine onboard watch, inspection and maintenance.

Analysis of implications

17 The co-sponsors do not foresee major costs to the maritime industry. The proposed way forward on this matter would utilize existing resources and infrastructure and does not require significant capital investment. This means that the cost of implementing the proposal is minimal, while having a maximum effectiveness as to the arrangement and maintenance of systems on board resulting in avoidance of fire incidents. Meantime, the envisaged amendment of SOLAS regulation II-2/4 is designed to be simple and efficient and might require upgrading the training material for the crew members; typically, expenses for such an upgrade could be covered by overall training costs. The intention is to amend the pertinent requirements and consider recommendations to make them clearer and avoid inconsistency in application.

18 The administrative burden to the Organization and to the Member States is anticipated to be minimal. The *Checklist for identifying administrative requirements* is set out in annex 1 of this document.

Benefits

19 By achieving greater effectiveness and consistency of application of provisions of MSC.1/Circ.1321 and by the introduction of requirements of amended SOLAS regulation II-2/4 safety of ships will be increased.

Industry standards

20 No particular industry standards relevant to the issues exist.

Output

21 To mitigate the risks of fires in engine rooms due to the leakage from low-pressure fuel and lubrication oil pipes, the following new output is proposed for inclusion in the Committee's Work Programme with the output being placed on the agenda of the SSE Sub-Committee (involvement of HTW Sub-Committee may need to be considered):

"Revision of SOLAS regulation II-2/4 and relevant recommendations (MSC.1/Circ.1321) to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes".

22 Parts I and II of the check/monitoring sheet, as given in annex 2 to MSC.1/Circ.1500/Rev.2, have been completed and are provided in annex 2 of this document.

Human element

23 The completed checklist for considering human element issues contained in MSC-MEPC.1/Circ.5/Rev.5 is set out in annex 3 to this document.

Urgency

24 This proposal is not considered urgent and can be addressed by the Committee in the normal course of its work; it is suggested that two sessions would be needed to complete the work by the SSE Sub-Committee.

Roadmap

25 As the proposal envisages the work to be performed over two sessions of the SSE Sub-Committee, the initial focus should be on the revision of SOLAS regulation II-2/4 to determine the specifics of the requirements with one session to complete, then followed by revision of MSC.1/Circ.1321 on the basis of agreed draft text. At the same session in year 1, determination regarding involvement of HTW Sub-Committee would be required to look into seafarer training requirements, which may influence the final completion date of the output.

Action requested of the Committee

26 The Committee is invited to consider the proposals in paragraphs 20 and 23, and take action, as appropriate.

***

ANNEX 1

CHECKLIST FOR IDENTIFYING ADMINISTRATIVE REQUIREMENTS

(MSC-MEPC.1/Circ.5/Rev.5, annex 6)

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

Instructions:

(A) If the answer to any of the questions below is **YES**, the Member State proposing an output should provide supporting details on whether the requirements are likely to involve start-up and/or ongoing costs. The Member State should also give a brief description of the requirement and, if possible, provide recommendations for further work, e.g. would it be possible to combine the activity with an existing requirement?

(B) If the proposal for the output does not contain such an activity, answer **NR** (Not required).

(C) For any administrative requirement, full consideration should be given to electronic means of fulfilling the requirement in order to alleviate administrative burdens.

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

ANNEX 2

PARTS I AND II OF THE CHECK/MONITORING SHEET FOR THE PROCESS OF AMENDING THE CONVENTION AND RELATED MANDATORY INSTRUMENTS (PROPOSAL/DEVELOPMENT) (MSC.1/CIRC.1500/REV.2)

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

1	*Submitted by (Document Number and submitter)* **MSC 110/XX/XX – [XXX], IACS, IUMI**
2	*Meeting session* **MSC 110**
3	*Date (date of submission)* **XX March 2025**

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

1	*Strategic Direction* **7**
2	*Title of the output* ***Revision of SOLAS regulation II-2/4 and relevant recommendations (MSC.1/Circ.1321) to mitigate the risks of fires in the engine room caused by leakages from low-pressure fuel pipes and lubrication oil pipes***
3	*Recommended type of amendments* (MSC.1/Circ.1481) (delete as appropriate)
	• **Four-year cycle of entry into force** • ~~exceptional circumstance~~
4	*Instruments intended for amendment (SOLAS, LSA Code, etc.) or developed (new Code, new version of a code, etc.)* **SOLAS**
5	*Intended application (scope, size, type, tonnage/length restriction, service (International/non-international), activity, etc.)* **All ships to which SOLAS chapter II-2 applies**
6	*Application to new/existing ships* **new ships**
7	*Proposed coordinating sub-committee* **SSE Sub-Committee**
8	*Anticipated supporting sub-committees* **possibly HTW Sub-Committee**
9	*Time scale for completion* **2028**
10	*Expected date(s) for entry into force and implementation/application* **1 January 2032**
11	*Any relevant decision taken, or instruction given by the Committee* **None**

**

ANNEX 3

CHECKLIST FOR CONSIDERING AND ADDRESSING THE HUMAN ELEMENT

(MSC-MEPC.1/Circ.5/Rev.5, annex 5, appendix)

	1 Question	2 Yes/ No	3 IMO references	4 Considerations	5 Instructions
Workload			*Other relevant references may be added* *Strike out 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*
1	**Does the "output" affect workload?**	No		Proposed changes are mainly related to design as well as training of crew members and will not affect the onboard workload	
1.1	**On board, especially in the already intensive phases of the voyage and port operations to:**	No	~~*Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies* (MSC-MEPC.7/Circ.8)~~ ~~*Guidelines on fatigue* (MSC.1/Circ.1598)~~ ~~*Principles of minimum safe manning* (resolution A.1047(27))~~ ~~*Guidelines for the investigation of accidents where fatigue may have been an issue* (MSC/Circ.621)~~	See 1 above	

1.1.1	Operations including navigation, cargo and engineering	No		*See 1 above*	
1.1.2	Maintenance of the ships structure and its equipment	No		See 1 above, maintenance may focus on fuel oil system connections and joints	
1.1.3	Onboard administration in support of the ships' management systems	No		See 1 above, as may affect to training course and routing inspection by crew members.	
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		See 1 above	
1.1.5	Increased workload or time pressure on personnel if involved in implementation of changes prior to the implementation date	No		See 1 above, no particular workload been identified while effective training course provided.	
1.2	**Ashore, in a manner that would affect the ships operation to:**			Proposed changes give further clarification to SOLAS CH II-2 Part B, Reg. 4 and will not affect related processes	
1.2.1	Companies' administration	No		See 1.2 above	
1.2.2	Flag State, port State and classification societies administration such that certification and other processes are compromised or delayed	No		See 1.2 above	

	1 Question	2 Yes/ No	3 IMO references	4 Considerations	5 Instructions
Decision-making			*Other relevant references may be added* *Strike out 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*
2	**Does the "output" impact decision-making on board the ship?**			Proposed changes are mainly related to design as well as training of crew members and will not have any impact on decision making on board.	
2.1	By confusion with existing requirements and regulations	No		See 2 above, no confusion with existing requirement will be made.	
2.2	By changing responsibilities as laid out in the ISM Code	No		See 2 above	
2.3	By creating complexity in its implementation and/or in the safety management systems	No		See 2 above, as may affect to training course and routing inspection by crew members.	
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		See 2 above	

2.5	By limiting the time available to establish situational awareness, decide, communicate (possibly across time zones) or check	No		See 2 above	
2.6	By increasing reliance on judgement and administrative controls to manage major risks such as oil spills and collisions	No		See 2 above	
	1 **Question**	**2** **Yes/ No**	**3** **IMO references**	**4** **Considerations**	**5** **Instructions**
Living and working environment			*Other relevant references may be added* *Strike out 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?**	No	*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)	Proposed changes are mainly related to design as well as training of crew members and will not affect the living and working environment on board.	
3.1	By interfering with existing arrangements for abandonment, fire-fighting and other emergency plans or procedures	No		See 3 above	
3.2	By introducing new materials that could create an explosion, fire, environmental or	No		See 3 above	

	occupational health risk				
3.3	By introducing new high energy sources such as high-voltage, high pressure fluids	No		See 3 above	
3.4	By affecting access or egress and causing lack of ventilation in working spaces	No		See 3 above	
3.5	By affecting the habitability of accommodation spaces due to noise, vibration, temperatures, dust and other contaminants	No		See 3 above	
	1 **Question**	**2** **Yes/ No**	**3** **IMO references**	**4** **Considerations**	**5** **Instructions**
Operation and maintenance			*Other relevant references may be added* *Strike out 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*

4	**Does the "output" affect the operation and maintenance of the ship, its structure or systems and equipment?**	No	~~*Revised guidelines for the operational implementation of the International Safety Management (ISM) Code by Companies* (MSC-MEPC.7/Circ.8)~~ ~~*Guidelines for bridge equipment and systems, their arrangement and integration (BES)* (SN.1/Circ.288)~~ ~~*Principles of minimum safe manning* (resolution A.1047(27))~~ ~~*Issues to be considered when introducing new technology on board ships* (MSC/Circ.1091)~~ ~~*Guideline on software quality assurance and human-centred design for e-navigation* (MSC.1/Circ.1512)~~ ~~*Guidelines for the standardization of user interface design for navigation equipment* (MSC.1/Circ.1609)~~	The proposed changes will not add new equipment and will not affect the operation and expecting improving the maintenance of (fuel oil) system.	
	1 **Question**	**2** **Yes/ No**	**3** **IMO references**	**4** **Considerations**	**5** **Instructions**
4.1	By introducing equipment that the user may find difficult to operate or maintain or	No		See 4 above	

	may be unreliable				
4.2	By introducing new and/or novel technology, or technology that changes the role of the person	No		See 4 above	
4.3	By introducing requirements for new competencies and roles	No		See 4 above	
4.4	By overloading existing infrastructure such as power generation and ventilation systems	No		See 4 above	
4.5	By poor integration with existing systems and controls	No		See 4 above	
4.6	By introducing new and unfamiliar operations/procedures	No		See 4 above	
4.7	By introducing new and unfamiliar operating interfaces?	No		See 4 above	
4.8	By introducing risks to the ship during any modifications required prior to the implementation date of the output	No		See 4 above	
	1 **Question**	**2** **Yes/ No**	**3** **IMO references**	**4** **Considerations**	**5** **Instructions**

Measures to address the human element			*Other relevant references may be added* *Strike out 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:**	No	~~*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)~~	Proposed changes mainly pertain to design and updating the relevant training of crew members. They will not affect crew skills, operation and maintenance manuals, additional occupational safety requirements regarding PPE, or shore support.	
5.1	Training	No		See 5 above, no particular skill other than existing crew member's skill onboard	
5.2	Practical skill development and competences	No		See 5 above	
5.3	Operating, management and/or maintenance procedures	No		See 5 above	
5.4	Information/manuals for operation and maintenance	No		See 5 above	
5.5	Spares outfit	No		See 5 above, basic & usual spare pieces such gasket and fuel oil pipe's connections.	
5.6	Occupational safety requirements including guarding and PPE	No		See 5 above	

5.7	Shore support	No		See 5 above	