

SUB-COMMITTEE ON SHIP DESIGN AND
CONSTRUCTION
5th session
Agenda item 7

SDC 5/7/1
13 October 2017
Original: ENGLISH

**MANDATORY INSTRUMENT AND/OR PROVISIONS ADDRESSING SAFETY STANDARDS
FOR THE CARRIAGE OF MORE THAN 12 INDUSTRIAL PERSONNEL ON BOARD
VESSELS ENGAGED ON INTERNATIONAL VOYAGES**

Safety analysis for high-speed offshore vessels carrying up to 60 persons

Submitted by Denmark

SUMMARY

Executive summary: This document provides information on the outcome of a safety analysis for high-speed offshore vessels carrying up to 60 persons. The goal of the analysis was to identify potential hazards in connection with the carriage of more than 12 industrial personnel on high-speed offshore vessels and provide the Sub-Committee with the findings in order to support and facilitate the development of mandatory regulations for ships carrying industrial personnel.

Strategic direction: 5.2

High-level action: 5.2.1

Output: 5.2.1.4

Action to be taken: Paragraph 22

Related documents: SDC 3/11/2; MSC 96/WP.7, MSC 96/25; MSC 97/WP.7, MSC 97/22; SDC 4/8, SDC 4/8/1, SDC 4/16; SDC 5/INF.2 and SDC 5/INF.3

Background

1 MSC 96 agreed that the new SOLAS chapter [XV] should be supported by a new code for vessels carrying more than 12 industrial personnel. MSC 96 endorsed the recommendations of the Working Group on Carriage of industrial personnel that the new code should address both high-speed vessels and non-high speed vessels. The new code should be based on the 2008 SPS and the 2000 HSC Codes.

2 MSC 96 also endorsed the Group's recommendation that the draft new code should be developed following the goal-based approach.

3 MSC 96 further endorsed the decision that, with regard to the scope of application, the number of persons on board (or the number of industrial personnel on board) should be considered and other parameters, such as tonnage and/or length, might need to be introduced in the future as thresholds in the different sections, with the understanding that the code would be applicable regardless of ship size.

4 MSC 97 adopted resolution MSC.418(97) on *Interim recommendations on the safe carriage of more than 12 industrial personnel on board vessels engaged on international voyages* and endorsed the view of the Working Group on Carriage of industrial personnel that the proposed definitions of industrial personnel and offshore industrial activities should be a basis for the development of the mandatory instrument.

5 MSC 97 approved the roadmap developed by the Working Group (MSC 97/WP.7, annex 2) and instructed the SDC Sub-Committee to follow the approved roadmap when developing the draft new chapter [XV] of SOLAS and the draft new code.

6 SDC 4 established the Correspondence Group on Carriage of more than 12 industrial personnel on board vessels engaged on international voyages, with a view to reporting to SDC 5.

7 To support the development of the new code and the new SOLAS chapter [XV], Denmark tasked DNV GL with facilitating two workshops, one to identify the hazards (HAZID) and another to identify the risk-reducing measures. The HAZID workshop was conducted on 8 November 2016, and the workshop concerning risk-reducing measures was conducted on 1 December 2016.

8 The scope of the safety analysis was limited to high-speed offshore vessels carrying up to 60 persons, including the crew, and considered all phases of operation.

9 The group of participants in the workshops included all relevant stakeholders in relation to ship design, vessel operations, crew, occupational health and wind turbine operations.

10 By providing the results and information of the safety analysis, Denmark hopes to contribute with some of the information needed for the Sub-Committee to develop regulations applicable to both high-speed vessels and non-high speed vessels. This safety analysis, even though it only reflects up to 60 persons, will hopefully be part of the foundation for the new code with the same thresholds as the 2008 SPS Code (up to 60 persons, between 61 and up to 240 persons, and more than 240 persons).

Discussion

Identified risks

11 Key hazards have by nature different ranks and different expected frequencies of occurrence, and they also vary in terms of severity. The HAZID workshop participants made their contributions for such a classification. The hazards were grouped into 12 topics, as presented in table 1 below.

Table 1 – Hazard rating for each topic

Topic	No of hazards	H	M	L
1. Fire/explosion safety	11	5	1	5
2. Structural safety	9	5	3	1
3. Damage stability	2	2	0	0
4. Escape, evacuation and recovery	7	3	4	0
5. Overnight accommodation offshore	1	0	0	1
6. 24-hour operation	3	1	1	1
7. Dangerous goods	3	0	3	0
8. "Walk-to-work"	2	1	1	0
9. Manning	3	1	2	0
10. Operational aspects	4	2	2	0
11. Small boat operation from CTV	1	1	0	0
12. Manoeuvrability	2	2	0	0
SUM	48	23	17	8

12 The hazards were classified as high, medium or low risk, as presented in table 2 below.

Table 2 – Description of risk categories

Category	Description
High	Risk-reducing measures must be discussed
Medium	Risk-reducing measures should be discussed to ensure that the risk is as low as reasonably practical.
Low	It is not necessary to include risk-reducing measures, as the increase in number of persons on board does not influence the risk level and the risk is acceptable.

High risks

13 The table above indicates 23 hazards classified as high risk, largely related to: fire/explosion safety, structural safety, damage stability and escape, evacuation and recovery.

14 Examples of these hazards are: fire in accommodation, electrical fire, fire in engine compartment, hard impacts at boat landings, collision with another vessel, loss of structural integrity, lack of knowledge about damage stability, unsuccessful evacuation and man-overboard during transfer of personnel to/from wind turbine or another vessel offshore.

Medium risks

15 Seventeen hazards were classified as medium risk and are largely related to: structural safety, dangerous goods and escape, evacuation and recovery.

16 Some of these hazards are: impact with wind turbine cabling anodes, impact with accommodation vessel, incorrect handling or storage of dangerous goods, incorrect handling of waste from wind turbine, unsuccessful rescue and man-overboard during transit.

Low risks

17 Eight hazards were classified as low risk, whereof five are related to fire/explosion safety. The workshop members assessed that, since dangerous goods on high-speed offshore vessels are stored in designated deck areas, it is easy to detect fire/explosions and the consequences were considered as low.

18 The four other low risks related to fire/explosion safety were all related to different fueling or bunkering operations. Such operations are today regulated by the industry through site specific procedures dependent on the setup and the specific equipment used.

The complete report

19 The hazards listed in this document have been highlighted in order to introduce the hazards identified in the safety analysis. The full text of the report is reproduced in the annex to document SDC 5/INF.2 (Denmark) and the executive summary of the report is set out in the annex.

Proposal

20 The information from the safety analysis is of specific relevance to high-speed vessels carrying industrial personnel and not necessarily to non-high speed vessels.

21 Denmark proposes to include the information of relevance to high-speed vessels from the safety analysis (SDC 5/INF.2, annex) in the further development of mandatory regulations addressing both high-speed vessels and non-high speed vessels.

Action requested of the Sub-Committee

22 The Sub-Committee is invited to consider the above and, in particular, the proposal in paragraphs 20 and 21, and take action as appropriate.

ANNEX

EXECUTIVE SUMMARY OF THE SAFETY ANALYSIS FOR HIGH-SPEED OFFSHORE VESSELS CARRYING UP TO 60 PERSONS

To respond to the development within the offshore wind industry, the Danish Maritime Authority (DMA) is examining the possibilities of establishing a safety standard equivalent to that of the passenger craft safety standard, by creating a safety standard for high-speed offshore craft carrying more than 12 wind turbine technicians (WTT). The intended safety standard should mitigate the particular hazards that this type of vessels encounters due to the nature of their operations and the increased number of persons on board. The current regulations make allowance for only up to 12 passengers on board, but there is a need in the industry to further increase this number. A possible new safety standard must, therefore, apply to the carriage of up to 60 persons, including 12 passengers. The DMA has engaged DNV GL for facilitating two workshops, one to identify the hazards (HAZID) and one to identify the risk-reducing measures. The HAZID workshop was conducted on 8 November 2016, and the workshop concerning risk-reducing measures was conducted on 1 December 2016.

The scope of the assessment was limited to high-speed offshore craft carrying up to 60 persons, including the crew, and considered all phases of operation:

- transit to/from wind farms;
- docking/undocking at wind turbines;
- 24-hour operation/overnight accommodation;
- transfer of personnel and equipment to/from the wind turbine or larger vessels (floating hotels or SPS certified vessels); and
- external coordination of ship traffic within offshore wind farms and the possibility of external assistance in case of evacuation

The participants in the workshop were operators, masters, designers, chief engineers, and others from the industry. The DMA was represented by observers, and DNV GL conducted the workshop. During the first workshop, 48 hazards within 12 topics were identified: 23 of them were categorized as "High" risk, 17 as "Medium" risk, and 8 as "Low" risk. The topics which appeared to be the most critical were "Fire/explosion safety", "Structural safety", and "Escape, evacuation and recovery", with six, eight, and seven "High" and "Medium" risk hazards, respectively. The "High" and "Medium" hazards were the scope for identifying risk-reducing measures during the second workshop. The risk analysis was carried out based on the IMO FSA Guidelines (MSC-MEPC.2/Circ.12/Rev.1). The identified measures were operational and structural measures, probability and consequence reducing measures, and they met the provisions of the *Generic guidelines for developing IMO goal-based standards* (MSC.1/Circ.1394/Rev.1). "Fire and explosion safety", "Structural safety/Damage stability", "Escape, evacuation and recovery", and "Dangerous goods" were the topics to which the participants contributed the most. A recurring discussion during the workshop was whether to include wind turbine technicians in the muster list on board.

The work was initiated before the decision regarding industrial personnel was taken at MSC 97. Nevertheless, wind turbine technicians are expected to meet the criteria described in the *Interim recommendations on the safe carriage of more than 12 industrial personnel on board vessels engaged on international voyages* (MSC.418(97)), and wind turbine technicians are, therefore, not considered or treated as passengers under SOLAS regulation 1/2(e), but rather as industrial personnel.

The 2000 HSC Code requirements for cargo craft were used as a basis during the second workshop, and the goal was to come up with risk-reducing measures not already covered by the 2000 HSC Code, thereby creating a safety level equivalent to that of a passenger craft. The 2000 HSC Code requirements for passenger craft are similar in structure to the cargo requirements, but include stricter requirements due to the number of passengers permitted to be carried on board. A review of the two sets of requirements, highlighting the differences, was presented at the start of the second workshop.

The hazards of greatest interest to the DMA are the hazards for which the DMA can regulate the requirements for mitigating measures. In general, these are the requirements regarding safety issues directly linked to the construction and equipment of the vessels. Of the 12 hazard topics, the following five are the most relevant:

- fire/explosion safety;
- structural safety;
- damage stability;
- escape, evacuation and recovery; and
- dangerous goods

Within the above topics, the "High" and "Medium" ranked hazards that is important to consider when increasing the number of wind turbine technicians on board are, but not limited to, the following:

- fire in the galley;
- electrical fires;
- fire in an engine compartment;
- fire in the accommodation;
- loss of structural integrity;
- grounding;
- unsuccessful evacuation;
- unsuccessful rescue;
- man-overboard during transit;
- crew overboard;

- man-overboard during idling;
 - incorrect handling of dangerous goods;
 - incorrect storage of dangerous goods; and
 - incorrect handling of waste from wind turbines, e.g. oily rags.
-