PASSENGER SHIP SAFETY

Report of the intersessional meeting of the Experts Group on Formal Safety Assessment (FSA)

Submitted by the Chairman of the FSA Experts Group

SUMMARY

Executive summary: This document reports on the intersessional meeting of the Formal Safety Assessment (FSA) Experts Group

Strategic direction: 12.1

High-level action: 12.1.1

Planned output: 12.1.1.1 and 12.1.1.2

Action to be taken: Paragraph 21

Related documents: SLF 55/INF.6, SLF 55/INF.7, SLF 55/INF.8, SLF 55/INF.9; MSC 92/26, paragraphs 6.19 and 6.20, MSC 92/WP.8/Rev.1, paragraph 37 and MSC-MEPC.2/Circ.12

General

1 The Experts Group on Formal Safety Assessment (FSA) met from 11 to 13 November 2013 under the chairmanship of Mr. K. Yoshida (Japan).

2 The group was attended by following experts nominated by Member States and non-governmental organizations:

   Mr. B. Altmayer    Mr. J. Kent
   Mr. J. Ballesio    Mr. N. Makar
   Mr. J. Bao         Mr. K. Metselaar
   Mr. A. Breuillard  Dr. Y. Ogawa
   Dr. E. Brünner     Mr. J. Sirkar
   Mr. R. Griffiths   Dr. R. Skjong
   Mr. V. Jenkins     Mr. S. Takeda
   Ms. J. Kasturia    Mr. L. Zhuang
and the following observers also attended the meeting:

Mr. E. Enriquez (Philippines)  Mr. S. Papageorgiou (EC)
Dr. A. Jasionowski (EC)          Prof. A. D. Papanikolaou (Denmark
Mr. L. Karlsen (Norway)         and the United Kingdom)
Mr. M. Koopmans (EC)             Mr. R. Patrimonio (Philippines)
Mr. R. Mason (EC)               Mr. J. Spremulli (Liberia)
Mr. O. Olufsen (Denmark         and the United Kingdom)

Terms of reference

3 MSC 92 instructed the FSA Experts Group to review the EMSA and GOALDS studies (SLF 55/INF.6, SLF 55/INF.7, SLF 55/INF.8 and SLF 55/INF.9), taking into account the risk models and calculated risk and the validity of the data and assumptions that were used, based on the revised FSA Guidelines (MSC-MEPC.2/Circ.12).

4 The group, having noted the following part of the report of the Working Group on Passenger Ship Safety at MSC 92 (paragraph 37.7 of document MSC 92/WP.8/Rev.1):

"(the working group) noting that the EMSA and GOALDS studies were not formal FSA reports, agreed to invite the Committee to instruct the FSA Expert Group to conduct a limited evaluation on the reliance used in the reports, taking into account:

.1 the risk models used and calculated risk; and

.2 the validity of the data and assumptions that were used,

and provide advice to MSC 93;"

agreed, in principle, that the scope of work to be done by the group should be limited as per the above paragraph.

Presentation of EMSA and GOALDS studies

5 The group noted the information on the study commissioned by the European Maritime Safety Agency (EMSA) on the specific damage stability parameters of ro-ro passenger ships according to SOLAS 2009, including water on deck calculation, as presented by Dr. A. Jasionowski.

6 The group also noted the information on the results of the “GOAL based Damage Stability” (GOALDS) project on collision and grounding damage statistics, probability of survival (s factor) for passenger ships and the development of a new risk-based damage stability requirement for passenger ships, based on cost-benefit assessment, as presented by Prof. A. D. Papanikolaou and Mr. O. Olufsen.

7 The group noted that the EMSA study is related to RoPax only, while the GOALDS study deals with RoPax and cruise ships, and that both studies used the previous version of the FSA Guidelines valid at the time when they were conducted.

8 The group also noted that the EMSA study was conducted within the scope of review of required subdivision index R in the regulatory framework of damaged stability (in SOLAS chapter II-1), and that the derived Risk Control Options (RCOs) only relate to required index R, which is consistent with the goal-based approach.
Review of EMSA and GOALDS studies

Discussion on GCAF and NCAF of the FSA Guidelines

9 The group noted that the updating of Net Cost of Averting a Fatality (NCAF) and Gross Cost of Averting a Fatality (GCAF) criteria in document SLF 55/INF.9 (GOALDS), paragraph 3.7, is in compliance with the revised FSA Guidelines, appendix 7, paragraph 3.2. The group also noted that the final recommendation regarding the required index R is not sensitive to the exact value of the updated NCAF and GCAF criteria (see SLF 55/INF.9, figure 25). In this regard, the group, noting that MSC 92 had not requested the group to consider modifications to CAF values at this session, agreed to suggest the Committee that the value would be determined at each FSA according to the revised FSA Guidelines, appendix 7, paragraph 3.2.

Cost benefit analysis (CBA)

10 The group noted that cost-benefit analysis in the studies, carried out by EMSA and GOALDS, are generally conducted in line with the FSA Guidelines. The group also noted that all the related stakeholders, including shipyards, were involved in the GOALDS project.

Casualty data

11 Following discussion, the group agreed that both of the studies used the data as much as available and appropriate. In this regard, the group recommended that the Committee encourage Member States to further provide the Organization with the information on casualties through the GISIS database. The group noted that near miss data may facilitate the hazard and risk analysis; however, it was also noted that there exists no scheme on reporting near miss cases in the Organization.

Risk models

12 With regard to the calculation of existing risk levels, the group confirmed that the studies carried by EMSA and GOALDS were in line with the revised FSA Guidelines.

13 With regard to fatality model, the group noted the following:

.1 the basis for use of 0 or 100% fatality assumption in the EMSA study;

.2 the different risk models proposed by GOALDS (one is similar to the EMSA assumption and the other is based on the speed of sinking/capsizing); and

.3 the concern expressed by CLIA regarding the assumption to use full capacity (100%) for cruise ships.

14 The group, while noting that the risk models may influence identification of RCOs and the cost benefit analysis through the assumption of possible reduction of Potential Loss of Life (PLL) based on the risk models, generally agreed that the risk models should be as realistic as possible. The group also noted that the final conclusion of GOALDS study is not sensitive to the risk models that were used.

Risk criteria

15 The group agreed that the study carried out by GOALDS is in line with the As Low As Reasonably Practicable (ALARP) principle. The group, having noted that the EMSA study introduced criteria for ALARP in their Frequency of an accident and the Number of fatalities (FN) diagram, which should be further evaluated in technical forums, also agreed that it was conducted in accordance with the FSA Guidelines.
**Sensitivity and uncertainty**

16 The group noted that sensitivity and uncertainty analysis was conducted in the reviewed studies in some extent, but noted there is no clear report on sensitivity and uncertainty analysis because these studies had been conducted before the revised FSA Guidelines were developed, which explicitly specify these analyses.

**Conclusions**

17 The group, bearing in mind that the EMSA and GOALDS studies were not full FSA reports and that the studies had been completed before the revised FSA Guidelines were finalized, generally agreed that both studies were adequately conducted in accordance with the FSA Guidelines valid at the time when they were conducted.

18 In agreeing that the studies were conducted in accordance with the FSA Guidelines, the group generally concluded that the recommended RCOs could be supported from a cost effectiveness point of view.

19 The group also agreed that the recommendations proposed in both studies need to be further considered by the SDC Sub-Committee from the technical point of view as instructed by the Committee.

20 The group noted that, despite the fact that the two studies used slightly different methodologies, both studies arrived at very similar recommendations with respect to raising the required subdivision index R.

**Action requested of the Committee**

21 The Committee is invited to approve the report in general and, in particular, to:

.1 note the opinion of the group regarding NCAF and GCAF that CAF values would be determined at each FSA according to the FSA Guidelines (paragraph 9);

.2 encourage Member States to further provide the Organization with the information on casualties through GISIS database (paragraph 11);

.3 endorse the group's conclusion that the EMSA and GOALDS studies were adequately conducted in accordance with the FSA Guidelines (paragraph 17);

.4 endorse the group's view that the RCOs recommended in both studies could be supported from a cost effectiveness point of view (paragraph 18); and

.5 note the group's view that the recommendations proposed in both studies need to be further considered by SDC Sub-Committee from the technical point of view (paragraph 19).