

DISCUSSION

TOWARDS A NEW SOLAS CONVENTION: A TRANSFORMATION OF THE SHIP SAFETY REGULATORY FRAMEWORK

M J Nunez Sanchez, Ministry of Transport and Public Works, Spain
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COMMENT

O Kanifolskyi, MRINA, Ph.D., Docent of chair Theory and Designing of Ship of Odessa National Maritime University, Ukraine.

I congratulate the author of the article with his successful publication. The necessity to change the SOLAS is timely. Suggestions concerning simplifications in the application of the Convention, the use of more simple methods and delegation of greater freedom of choice for ship owners and designers have the right.

In my opinion, the increasing use of probabilistic methods in the rules of the Convention is not always justified. For example, the Graph - analytical method that has been used previously to assess the unsinkable ship, gives the designer more opportunity than the current Probabilistic standard.

It should be noted that the Convention sometimes contains conflicting requirements for the same vessel in various rules. This can be confirmed by considering, in the historical perspective, the ship “Titanic”, from which the SOLAS began. Some calculations are given below.

- SOLAS 2009. Regulation 8. Special requirements concerning passenger ship stability. «A passenger ship intended to carry 400 or more persons shall have watertight subdivision abaft the collision bulkhead...for a damage involving all the compartments within 0.08L measured from the forward perpendicular». For “Titanic”, the length of the damaged compartments is 21 m.
- SOLAS 2009. Calculations for attained subdivision index A. The maximum damage length should be no more than 60 m.
- The “Titanic” had damage with length about 100 meters [15]. The book [16] has data about the length of the hole near 90 m. This is a typical type of the damage “raking”.

To calculate the length of a possible damage, the formula proposed in [17]. This formula can be applied to ships having different parameters and for various underwater

obstacles. In order to test the proposed methodology, the calculation of the possible length of the damage for ship “Titanic” was held. In accordance with the formula of this work, the length of the possible damage may be equal to 74 m or $0,28 L$, Figure 6.

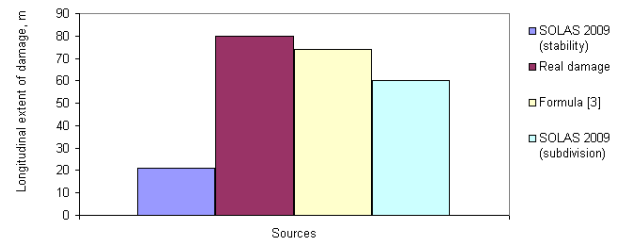


Figure 6. Length of the damage.

I think that the author of the article has a right to speak about the need to use common methods to assess possible hazards to the vessel.

AUTHOR'S RESPONSE

The author thanks the comments from **Prof. Kanifolskyi** and agrees that the Convention needs to be updated for the future and in particular due to its current complexity for the application on ships.

The author wants to indicate that the paper doesn't specifically focus on probabilistic regulations, although it considers that the use of probabilistic methodologies and alternative design is the right way forward, with careful consideration. The author also considers that the GBS-SLA approach as a methodology is not incompatible with the adoption of deterministic regulations derived from the FSA analysis or risk assessment methodologies, when carried out. As a matter of fact the use of FSA at IMO has led to the adoption of deterministic regulations.

Probabilistic regulations or the use of risk analysis to cover certain functional requirements of the rules lay one step ahead to provide flexibility.

However the probabilistic methodologies might lack of substantiated data to provide a satisfactory result and this is the point where suitable detailed models play an important role. It could be argued and agreed that FSA guidelines might need to include specific common methods to be used to assess specific hazards for the vessels, but that will be provided through the goals and functional requirements.

An example of conflicting requirements SOLAS 2009, which will be very soon amended, is a case that deserves to be mentioned. IMO indicated that SOLAS 2009 had a safety level equivalent to the previous SOLAS 90, but it

hasn't been the case and that is the reason for the next revision of the formulation.

It also needs to be reminded that SOLAS probabilistic is not recommended for small craft or high-speed craft. Cases such as the Titanic or the Costa Concordia do happen and these accidents (in particular the latter) needs to be considered so that the frequencies lead to suitable probabilities and thereafter the necessary subdivision is obtained through the probabilistic calculations. Finally raking will be considered in the next formulation following the evaluation of risk from raking by EMSA [18].

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