



IMO Correspondence Group Update

Development of Interim guidelines for use of Fibre Reinforced Plastic (FRP) elements within ship structures



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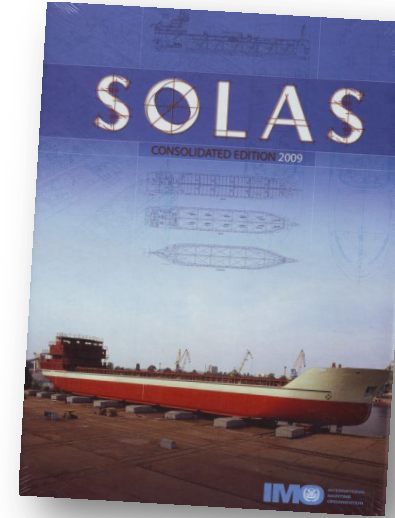
Alternative design and arrangements for fire safety

SOLAS (Safety Of Life At Sea) chapter II-2

- Regulation 4 Probability of ignition
- Regulation 5 Fire growth potential
- Regulation 6 Smoke generation potential and toxicity
- Regulation 9 Containment of fire
- Regulation 10 Fire fighting
- Regulation 11 Structural integrity
- Regulation 13 Means of escape
- ...
- Regulation 17 Alternative design and arrangements

Reg. 9 prescribes main vertical and horizontal zones of A-class divisions
= steel or other equivalent material
= a non-combustible material which, by itself or down to insulation provided, has structural and integrity properties equivalent to steel at the end of the standard fire test.

Reg. 11 prescribes the hull, superstructures, structural bulkheads, decks and deckhouses to be constructed of steel or other equivalent material.



Options for alternative design

SOLAS chapter II-2, Reg. 17 Alternative design and arrangements

Alternative solutions for fire safety are allowed if they can be shown to be at least as safe as a prescriptive design

Is shown through an analysis based on **MSC/Circ.1002**

SOLAS chapter I, Reg. 5 Equivalents

MSC.1/Circ.1455

Guidelines for the approval of alternatives and equivalents in various IMO instruments



“Development of interim guidelines for use of Fibre Reinforced Plastic (FRP) within ship structures”

SDC2 CG presented results and draft guidelines.
Decided to accept guidelines and submit to MSC.

MSC95 Guidelines rejected and sent back to SDC3.

SDC3 Correspondence Group reinstated

Terms of Reference:

.1 update the draft Interim guidelines for use of Fibre Reinforced Plastic (FRP) elements within ship structures: Fire safety issues (SDC 2/25, annex 6) with explicit statements regarding the need to consider the fire safety objectives and functional requirements of SOLAS chapter II-2;

.2 reconsider the scope of the draft Interim guidelines and develop an explanation of the term "element";

.3 further develop the draft interim guidelines with an focus on matters related to combustibility and structural integrity; and

.4 submit a written report to SDC 4.



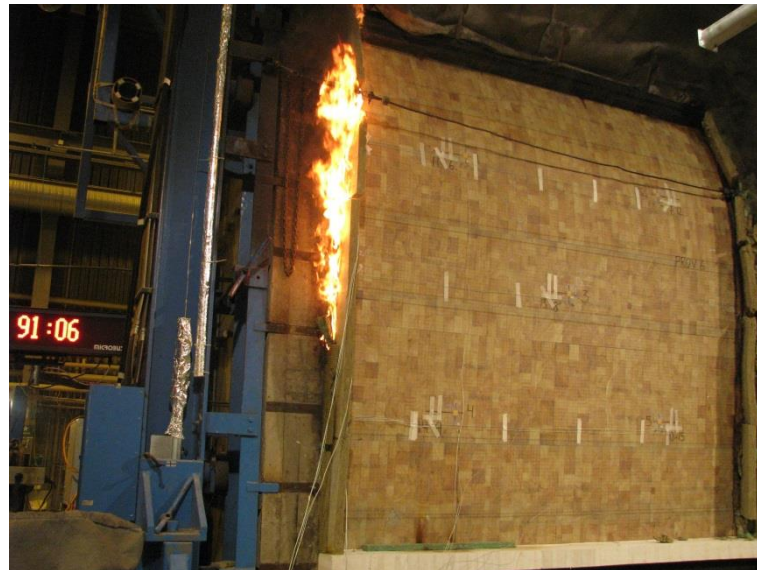
Results of Correspondence Group (1/3)

Consideration of functional requirements

The alternative design and arrangements SHALL MEET the fire safety objectives and functional requirements. Including functional requirement in Reg. II-2/2.1 stating that use of combustible materials shall be restricted.

Definition of FRP

"Within these guidelines, FRP is defined as multi-material compositions of monolithic or sandwich constructions. Monolithic constructions and skin layers of sandwich constructions are based on long fibre reinforced resins. Reinforcements can be for example fabrics of glass, carbon, aramide or basalt fibres. Resins shall be based on duromer thermoset resin. Sandwich core materials are typically based on structural foams or honeycombs. Coatings (Gelcoats, Topcoats or paints), casting masses and adhesives are handled under this guideline as well."



Results of Correspondence Group (2/3)

Scope

Common understanding that the Interim guidelines do not adequately address risks associated with a fully composite ship or FRP structures making up a ship's (global) structural integrity.

Definition of element

["structure which may be removed without compromising the longitudinal strength of the ship"].

- .1 Structures: non-loadbearing structures below main deck and loadbearing structures above main deck
- .2 Integrated structures: elements integrated into the ship structure, without contribution to longitudinal strength (e.g. pool, sliding roof, stage, shell door, tender platform, etc.); and
- .3 Components: non-structural parts connected to the ship structure via joining methods (e.g. balcony, funnel, mast, gantry, flooring, etc.)

Results of Correspondence Group (3/3)

Testing of structural integrity

SOLAS → part 3 of annex 1 to the 2010 FTP Code

HSC Code → part 11 of annex 1 to the 2010 FTP Code (load)

Reference suitable to part 11, but with use of design load instead of static load (7 kN/m).



Thank you for your attention!

Questions?



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