



**BUREAU
VERITAS**

Guidelines on Alternative Design and Arrangements of Life-Saving Appliances

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**Guidance Note
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MARINE DIVISION

GENERAL CONDITIONS

ARTICLE 1

1.1. - BUREAU VERITAS is a Society the purpose of whose Marine Division (the "Society") is the classification ("Classification") of any ship or vessel or structure of any type or part of it or system therein collectively hereinafter referred to as a "Unit" whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsea or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

The Society:

- prepares and publishes Rules for classification, Guidance Notes and other documents ("Rules");
- issues Certificates, Attestations and Reports following its interventions ("Certificates");
- publishes Registers.

1.2. - The Society also participates in the application of National and International Regulations or Standards, in particular by delegation from different Governments. Those activities are hereafter collectively referred to as "Certification".

1.3. - The Society can also provide services related to Classification and Certification such as ship and company safety management certification; ship and port security certification, training activities; all activities and duties incidental thereto such as documentation on any supporting means, software, instrumentation, measurements, tests and trials on board.

1.4. - The interventions mentioned in 1.1., 1.2. and 1.3. are referred to as "Services". The party and/or its representative requesting the services is hereinafter referred to as the "Client". **The Services are prepared and carried out on the assumption that the Clients are aware of the International Maritime and/or Offshore Industry (the "Industry") practices.**

1.5. - The Society is neither and may not be considered as an Underwriter, Broker in ship's sale or chartering, Expert in Unit's valuation, Consulting Engineer, Controller, Naval Architect, Manufacturer, Shipbuilder, Repair yard, Charterer or Shipowner who are not relieved of any of their expressed or implied obligations by the interventions of the Society.

ARTICLE 2

2.1. - Classification is the appraisal given by the Society for its Client, at a certain date, following surveys by its Surveyors along the lines specified in Articles 3 and 4 hereafter on the level of compliance of a Unit to its Rules or part of them. This appraisal is represented by a class entered on the Certificates and periodically transcribed in the Society's Register.

2.2. - Certification is carried out by the Society along the same lines as set out in Articles 3 and 4 hereafter and with reference to the applicable National and International Regulations or Standards.

2.3. - It is incumbent upon the Client to maintain the condition of the Unit after surveys, to present the Unit for surveys and to inform the Society without delay of circumstances which may affect the given appraisal or cause to modify its scope.

2.4. - The Client is to give to the Society all access and information necessary for the safe and efficient performance of the requested Services. The Client is the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out.

ARTICLE 3

3.1. - The Rules, procedures and instructions of the Society take into account at the date of their preparation the state of currently available and proven technical knowledge of the Industry. They are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.

Committees consisting of personalities from the Industry contribute to the development of those documents.

3.2. - The Society only is qualified to apply its Rules and to interpret them. Any reference to them has no effect unless it involves the Society's intervention.

3.3. - The Services of the Society are carried out by professional Surveyors according to the applicable Rules and to the Code of Ethics of the Society. Surveyors have authority to decide locally on matters related to classification and certification of the Units, unless the Rules provide otherwise.

3.4. - The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not in any circumstances involve monitoring or exhaustive verification.

ARTICLE 4

4.1. - The Society, acting by reference to its Rules:

- reviews the construction arrangements of the Units as shown on the documents presented by the Client;
- conducts surveys at the place of their construction;
- classes Units and enters their class in its Register;
- surveys periodically the Units in service to note that the requirements for the maintenance of class are met.

The Client is to inform the Society without delay of circumstances which may cause the date or the extent of the surveys to be changed.

ARTICLE 5

5.1. - The Society acts as a provider of services. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty.

5.2. - The certificates issued by the Society pursuant to 5.1. here above are a statement on the level of compliance of the Unit to its Rules or to the documents of reference for the Services provided for.

In particular, the Society does not engage in any work relating to the design, building, production or repair checks, neither in the operation of the Units or in their trade, neither in any advisory services, and cannot be held liable on those accounts. Its certificates cannot be construed as an implied or express warranty of safety, fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

5.3. - The Society does not declare the acceptance or commissioning of a Unit, nor of its construction in conformity with its design, that being the exclusive responsibility of its owner or builder, respectively.

5.4. - The Services of the Society cannot create any obligation bearing on the Society or constitute any warranty of proper operation, beyond any representation set forth in the Rules, of any Unit, equipment or machinery, computer software of any sort or other comparable concepts that has been subject to any survey by the Society.

ARTICLE 6

6.1. - The Society accepts no responsibility for the use of information related to its Services which was not provided for the purpose by the Society or with its assistance.

6.2. - If the Services of the Society cause to the Client a damage which is proved to be the direct and reasonably foreseeable consequence of an error or omission of the Society, its liability towards the Client is limited to ten times the amount of fee paid for the Service having caused the damage, provided however that this limit shall be subject to a minimum of eight thousand (8,000) Euro, and to a maximum which is the greater of eight hundred thousand (800,000) Euro and one and a half times the above mentioned fee.

The Society bears no liability for indirect or consequential loss such as e.g. loss of revenue, loss of profit, loss of production, loss relative to other contracts and indemnities for termination of other agreements.

6.3. - All claims are to be presented to the Society in writing within three months of the date when the Services were supplied or (if later) the date when the events which are relied on were first known to the Client, and any claim which is not so presented shall be deemed waived and absolutely barred. Time is to be interrupted thereafter with the same periodicity.

ARTICLE 7

7.1. - Requests for Services are to be in writing.

7.2. - Either the Client or the Society can terminate as of right the requested Services after giving the other party thirty days' written notice, for convenience, and without prejudice to the provisions in Article 8 hereunder.

7.3. - The class granted to the concerned Units and the previously issued certificates remain valid until the date of effect of the notice issued according to 7.2. here above subject to compliance with 2.3. here above and Article 8 hereunder.

7.4. - The contract for classification and/or certification of a Unit cannot be transferred neither assigned.

ARTICLE 8

8.1. - The Services of the Society, whether completed or not, involve, for the part carried out, the payment of fee upon receipt of the invoice and the reimbursement of the expenses incurred.

8.2. Overdue amounts are increased as of right by interest in accordance with the applicable legislation.

8.3. - The class of a Unit may be suspended in the event of non-payment of fee after a first unfruitful notification to pay.

ARTICLE 9

9.1. - The documents and data provided to or prepared by the Society for its Services, and the information available to the Society, are treated as confidential. However:

- clients have access to the data they have provided to the Society and, during the period of classification of the Unit for them, to the **classification file** consisting of survey reports and certificates which have been prepared at any time by the Society for the classification of the Unit;
- copy of the documents made available for the classification of the Unit and of available survey reports can be handed over to another Classification Society, where appropriate, in case of the Unit's transfer of class;
- the data relative to the evolution of the Register, to the class suspension and to the survey status of the Units, as well as general technical information related to hull and equipment damages, are passed on to IACS (International Association of Classification Societies) according to the association working rules;
- the certificates, documents and information relative to the Units classed with the Society may be reviewed during certifying bodies audits and are disclosed upon order of the concerned governmental or inter-governmental authorities or of a Court having jurisdiction.

The documents and data are subject to a file management plan.

ARTICLE 10

10.1. - Any delay or shortcoming in the performance of its Services by the Society arising from an event not reasonably foreseeable by or beyond the control of the Society shall be deemed not to be a breach of contract.

ARTICLE 11

11.1. - In case of diverging opinions during surveys between the Client and the Society's surveyor, the Society may designate another of its surveyors at the request of the Client.

11.2. - Disagreements of a technical nature between the Client and the Society can be submitted by the Society to the advice of its Marine Advisory Committee.

ARTICLE 12

12.1. - Disputes over the Services carried out by delegation of Governments are assessed within the framework of the applicable agreements with the States, international Conventions and national rules.

12.2. - Disputes arising out of the payment of the Society's invoices by the Client are submitted to the Court of Nanterre, France.

12.3. - Other disputes over the present General Conditions or over the Services of the Society are exclusively submitted to arbitration, by three arbitrators, in London according to the Arbitration Act 1996 or any statutory modification or re-enactment thereof. The contract between the Society and the Client shall be governed by English law.

ARTICLE 13

13.1. - These General Conditions constitute the sole contractual obligations binding together the Society and the Client, to the exclusion of all other representation, statements, terms, conditions whether express or implied. They may be varied in writing by mutual agreement.

13.2. - The invalidity of one or more stipulations of the present General Conditions does not affect the validity of the remaining provisions.

13.3. - The definitions herein take precedence over any definitions serving the same purpose which may appear in other documents issued by the Society.

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1. General

1.1. Scope and objective of the guidelines

- These guidelines are intended to support LSA manufacturers, shipowners, shipyards and the Flag State administrations in dealing with the approval of alternative design and arrangements for LSAs.
- The provisions adopted in SOLAS Chapter I Part A Regulation 5 and in the 2006 MSC.1/Circ.1212 circular draw on the principle of equivalency to demonstrate that a trial alternative design or arrangement is as safe / effective as prescriptive designs or arrangements.
- The present guidelines elaborate on the new regulatory framework and put forward effective solutions to implement the approval process consistently.

1.2. Definitions

- *Novel Life-Saving Appliance (LSA) or arrangement* is a life-saving appliance or arrangement which embodies new features not fully covered by the provisions of SOLAS chapter III or the LSA Code but which provides an equal or higher standard of safety.
- *Life-saving system (LSS)* designates the system composed of all LSAs installed on a ship and the corresponding arrangements. A LSS is usually composed of different types of LSAs.
- *Prescriptive design* means a design of safety measures which comply with the regulatory requirements set out in chapter III of SOLAS.
- *Alternative design and arrangements* means measures which deviate from prescriptive requirements of SOLAS, but are suitable to satisfy the intent of these requirements. The term includes a wide range of measures, including alternative shipboard structures and systems based on novel or unique designs, as well as traditional shipboard structures and systems that are installed in alternative arrangements or configurations.

1.3. Overview of the main issues

- LSA designs have not much evolved since the first SOLAS convention of 1974. Several major catastrophes involving passenger ships pointed out the lack of proper assessment of existing systems. Despite training and maintenance, LSA design has not benefited enough from R&D investments compared to the rest of the ship design.
- The rapid development of the cruising industry has pushed the construction of giant passenger ships causing a growing concern about the suitability and performance of conventional LSAs. Innovative solutions for LSA design and arrangement could contribute to generate more profit for the ship.

- The current approval framework is prescriptive and draws on existing LSA designs (lifeboats and life rafts). In this context, the IMO has however opened the door for the approval of alternative LSA design and arrangements.

2. The regulatory framework

2.1. Regulatory framework for the approval of conventional LSAs

2.1.1. The SOLAS convention

- The last SOLAS convention was adopted in 1974 and addresses LSAs in Chapter III with statutory requirements. Important revisions were adopted in 1983, 1996 and 2006.
- The objective of chapter III is to prescribe the requirements for ship approval with respect to LSA installation and operation.
- Its requirements are specific to different LSA types (personal LSAs, lifeboats, liferafts, Marine Evacuation Systems) and ship types (passenger ships, cargo ships,).

2.1.2. The LSA Code (and associated guidelines for testing and evaluation)

- The “International Life-Saving Appliance Code” was adopted by IMO MSC in June 1996 by resolution MSC.48(66) in order to provide international standards for the life-saving appliances required by SOLAS chapter III.
- The Code was made mandatory through SOLAS Regulation III/34 (resolution MSC.47(66)) and entered into force on 1 July 1998.
- The testing of life-saving appliances was carried out through IMO resolution A.689(19) but a “Revised recommendation on testing of life-saving appliances” (resolution MSC.81(70)) has now effectively replaced this resolution.
- The “Code of practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements” (resolution A.520(13)) was adopted in 1983 in order to address prototype novel life-saving appliances and arrangements which may be developed and do not fully meet the requirements of chapter III of the 1974 SOLAS Convention but provide the same or higher safety standards.

2.1.3. The European Marine Equipment Directive

- In the European Union, the conformity assessment of some types of marine equipment is regulated by the European directive 96/98/EC, called Marine Equipment Directive (MED), and adopted in 1996. Some LSAs are covered by the MED.

- The MED provides an approval scheme within the EU based on (1) the principle of mutual recognition between EU Member States and, (2) the designation of Notified Bodies to undertake conformity assessment procedures. The scheme set out in the directive ensures that certificates issued by notified bodies, are acceptable to each member state through the harmonization of their approval requirements.
- Marine equipments covered by the MED are listed in two distinct groups:

Category of marine equipment	Approval scheme
Annex A.1: "equipment for which detailed testing standards already exist in International instruments"	EC harmonised type approval scheme as described in Annex B of the MED
Annex A.2: "equipment for which <u>no</u> detailed testing standards already exist in International instruments"	National type approval scheme

Table 1 : MED approval schemes for different categories of marine equipment

- In this framework, conventional LSA equipments (including life rafts, lifeboats and rescue boats) are listed in Annex A.1. Alternately, according to Article 14 of the MED, non-conventional LSA equipment (whose design criteria deviate from IMO requirements) remains to National approval scheme.

2.2. Regulatory framework for the approval of alternative LSA design and arrangements

2.2.1. The principle of equivalency

- The SOLAS convention allows contracting member States to approve materials, arrangements or appliances that deviate from the requirements prescribed in the convention under certain conditions. Yet, this type of approval should satisfy the so called 'principle of equivalency' between the prescriptive requirements and the proposed design. This is expressed in general terms as follows:

*"The Administration may allow any other fitting, material, appliance or apparatus [...] to be fitted or carried [...], if it is [...] at least **as effective as** that required by the present regulations".*

SOLAS, Regulation I/5 on "Equivalents"

- Thus, the principle of equivalency states that a proposed alternative design should provide compliance with the overall criteria for safety and suitability for intended service established in the applicable rules. In other words, the trial alternative design should demonstrate to provide equivalent levels of safety or effectiveness with those ensured by a prescriptive design.

2.2.2. The regulation SOLAS III/38

- As presented in section 2.1.1, SOLAS Regulation I/5 defines the principle of equivalency in general terms
- It was further refined under the concept of “alternative designs and arrangements” that was explicitly included in several chapters of the convention such as Fire Safety, Machinery and Life-Saving Appliances.
- The aim was to provide a common framework in order to ensure a harmonised approach for assessing the effectiveness and safety level of such innovative or novel designs that are out of the scope of prescriptive requirements.
- For LSAs, this concept is addressed by SOLAS, Regulation III/38 below “Alternative design and arrangements for life-saving appliances” that was adopted by resolution MSC.216(82) (Entry into force 1st of July 2010).

*“Life-saving appliances and arrangements may deviate from the requirements set out in part B [of SOLAS Chapter III], provided that the alternative design and arrangements **meet the intent of the requirements** concerned and **provide and equivalent level of safety**”*

*“When alternative design or arrangements deviate from the prescriptive requirements of part B, an **engineering analysis, evaluation and approval** of the design and arrangements shall be carried out in accordance with this regulation.”*

SOLAS, Regulation III/38

2.2.3. IMO Guidelines MSC.1/Circ.1212

- Regulation SOLAS III/38 “Alternative design and arrangements for life-saving appliances” (section 2.1.2) requires to perform an “engineering analysis” to demonstrate equivalency with the prescriptive design. This “engineering analysis” is supported by a methodology outlined in the “Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III” (MSC.1/Circ.1212), adopted in December 2006. The content of these guidelines as well as the detail of the required qualitative and quantitative analyses are presented on Figure 1 below:

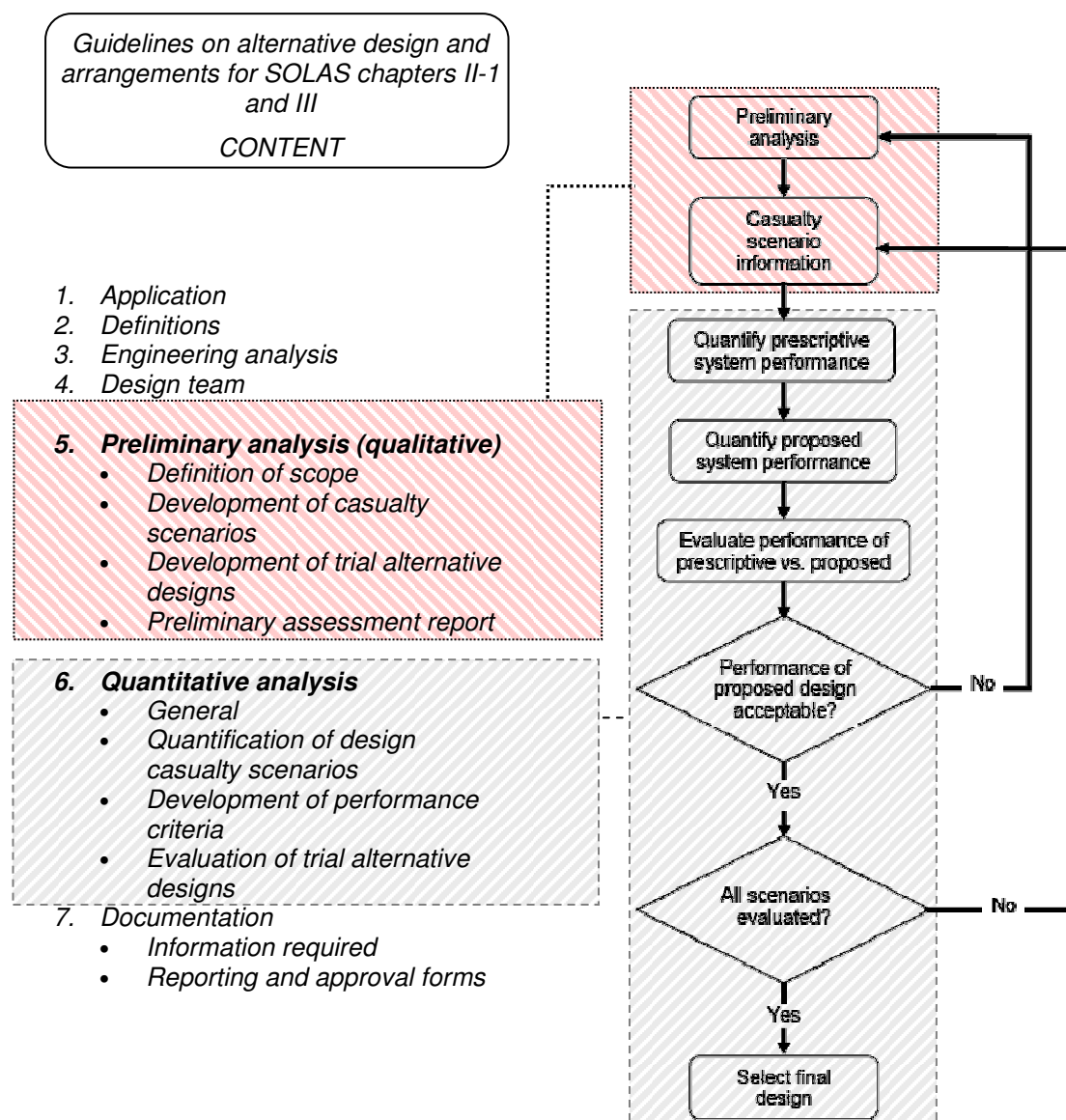


Figure 1 : Guidelines on alternative design and arrangements for SOLAS chapters II-1 and III (MSC.1/Circ.1212)

- It must be noted that *“these guidelines are not intended to be applied to the type approval of individual materials, components or portable equipment”* (MSC.1/Circ.1212, §1.2). This means that the approval scheme that is further described in these guidelines are not suitable for the type approval of LSA but for *“the approval of an alternative design deviating from the prescriptive requirements of SOLAS [...] (chapter) III”* (MSC.1/Circ.1212, §1.1) on a case by case basis.

2.2.4. Testing, evaluation and approval of life-saving appliances according to the amended regulation SOLAS III/4, §3

- As the new SOLAS regulation III/38 was introduced in 2006, the provisions of III/4, §3 related to the approval of novel LSA by Flag State Administrations were amended accordingly:

“§3 Before giving approval to novel life-saving appliances or arrangements, the Administration shall ensure that such:

*.1 appliances provide **safety standards at least equivalent to the requirements of this chapter and the Code** and have been **evaluated and tested** based on the **guidelines developed by the Organization***; or*

*.2 arrangements have successfully undergone an engineering analysis, evaluation and approval in accordance with **regulation 38**.*

** Refer to the guidelines to be developed by the Organization.”*

SOLAS, Regulation III/4 as amended by MSC.216(82)

- This regulation is split into two distinct paragraphs dealing with respectively appliances and arrangements. However, it should be noted that the requirements for appliances and arrangements are quite similar: §3.1 requires explicitly demonstration of safety equivalency for appliances and §3.2 requires that arrangements undergo an analysis as presented in regulation 38 which in fact also intends to demonstrate safety equivalency. Therefore, the same type of tools can be used for the approval of both life-saving appliances and arrangements.
- It should also be noted that during the period until the “guidelines to be developed by the Organisation” as mentioned in regulation III/4, §3, are developed, the evaluation and testing of the life-saving appliances should at least comply with the current “Code of Practice for the evaluation, testing and acceptance of prototype novel live-saving appliances and arrangements” (A 520(13)).

2.3. Summary of the regulations for the approval of life-saving appliances

- Table 2 summarises the regulatory framework for the approval of LSA design and arrangements:

Approval of:		Until July 2010	From July 2010 onwards
Conventional features	Life-saving Appliances and arrangements	- MSC.81(70) - A.689(17) - LSA Code - SOLAS III/4 §2	- MSC.81(70) - A.689(17) - LSA Code - SOLAS III/4, §2
Novel features	Life-Saving Appliances and arrangements	- Resolution A.520(13) - SOLAS III/4 §3 - SOLAS I/5	MSC.1/Circ.1212 (2006) SOLAS III/38 (2006) Amended SOLAS III/4, §3 (2006) - SOLAS I/5 IMO guidelines (yet to be developed) <u>OR</u> resolution A.520(13) (if the IMO guidelines are not developed)

Table 2 : Regulatory framework for the approval of alternative LSA design and arrangements

- Regarding all the different interrelated regulations applying to the approval of novel life-saving appliances and arrangements, it is helpful to draw a global view of all of the regulatory requirements. Figure 2 below is intended to present such a view.