



GP 65-15

Design of Marine Life Saving Appliances

DRAFT FOR REVIEW

20 April 2010
Engineering Technical Practice
Engineering

Table of Contents

	Page
Foreword	4
1. Scope	5
2. Normative references.....	5
3. Terms and definitions.....	5
4. Symbols and abbreviations	7
5. General requirements for LSA	8
5.1. Applicable LSA codes, standards, and regulations.....	8
5.2. FSA and NRB requirements.....	8
6. Personal LSA.....	8
6.1. General.....	8
6.2. Lifebuoys	9
6.3. Lifejackets and work vests	9
6.4. Immersion suits.....	11
6.5. Anti-exposure suits	11
6.6. Thermal protective aids.....	12
6.7. Personal fire protection	12
7. Visual signals.....	12
7.1. Rocket parachute flares	12
7.2. Hand flares	13
7.3. Buoyant smoke signals	13
8. Survival craft.....	13
8.1. General.....	13
8.2. Life rafts.....	14
8.3. Lifeboats	15
8.4. Free-fall lifeboats	18
8.5. Fast rescue boats	18
8.6. Launch and recovery equipment.....	20
8.7. Secondary evacuation systems.....	21
8.8. Marine evacuation systems.....	22
9. Other LSAs	23

Copyright © 2010 BP International Ltd. All rights reserved.

This document and any data or information generated from its use are classified, as a minimum, BP Internal. Distribution is intended for BP authorized recipients only. The information contained in this document is subject to the terms and conditions of the agreement or contract under which this document was supplied to the recipient's organization. None of the information contained in this document shall be disclosed outside the recipient's own organization, unless the terms of such agreement or contract expressly allow, or unless disclosure is required by law.

In the event of a conflict between this document and a relevant law or regulation, the relevant law or regulation shall be followed. If the document creates a higher obligation, it shall be followed as long as this also achieves full compliance with the law or regulation.

9.1. Line throwing appliances.....	23
9.2. Global maritime distress safety system/radio installations.....	23
9.3. Search and rescue transponders	24
9.4. Emergency position-indicating radio beacon	24
9.5. Safety signage	24
Annex A (Informative) Anti-exposure and immersion suits	30
B.1. General.....	30
B.2. Anti-exposure suit	30
B.3. Immersion suit	30
Bibliography	31

List of Tables

Table 1 - LSA Code, standards, and regulations	26
--	----

Foreword

This is the first issue of Engineering Technical Practice (ETP) **Error! Reference source not found..**

This GP sets out BP requirements in addition to those required by International Maritime Organisation (IMO) regulation and as adopted by the applicable Flag State Administration (FSA), for the design and construction of Life Saving Appliances (LSA) and associated equipment installed on offshore installations, facilities and vessels.

This GP builds on the requirements of the IMO International Life Saving Appliance Code (LSA Code), which provides international standards for the LSA required by the International Convention for the Safety of Life at Sea (SOLAS), 1974, and as subsequently amended.

Although SOLAS and the LSA Code were developed for sea going vessels they provide internationally recognised, experience-based, minimum standards for LSA. In the absence of similar standards for offshore facilities BP Group philosophy for LSA is to apply SOLAS and the LSA Code to all types of offshore floating facilities.

Note. The MODU Code applies to a variety of types of vessels and makes specific provision for LSA on mobile drilling rigs and, where applicable, has also been applied to semi-submersible production facilities. The MODU Code could be applicable as a best practice in some cases.

This GP is not based on any previous heritage documents from merged BP companies.

1. Scope

This GP applies to the design and construction of marine LSA and associated equipment, fixtures, and fittings installed on offshore floating production facilities.

This GP applies to new projects only.

This GP does not address the operation and maintenance of, or training for the use of, LSA.

The operation maintenance and training aspects for survival craft are addressed within BP GRP 5.6-0004^[1].

2. Normative references

The following referenced documents may, to the extent specified in subsequent clauses and normative annexes, be required for full compliance with this GP:

- For dated references, only the edition cited applies.
- For undated references, the latest edition (including any amendments) applies.

BP

GP 65-20 Design of Floating Hull Structure and Stability.

International Maritime Organisation (IMO)

LSA Code International Life-Saving Appliances Code; Resolution MSC 48(66).

SOLAS International Convention for the Safety of Life at Sea.

MODU Code The Code for the Construction and Equipment of Mobile Offshore Drilling Units, 1989. Chapters 10 and 11.

IMO Res. A.658 (16) Use and fitting of retro-reflective materials on life-saving appliances.

IMO Res. A.760 (18) Symbols related to life-saving appliances and arrangements; as amended by Resolution MSC 82(70).

IMO Res. A.802 (19) Performance standards for survival craft transponders for use in search and rescue operations.

IMO Res. MSC 81(70) As amended by IMO Resolution MSC 200 (80). Recommendation on Testing of Life-Saving Appliances.

3. Terms and definitions

For the purpose of this GP, the following terms and definitions apply:

Anti-exposure suit

Protective suit designed for use by rescue boat crews and marine evacuation system operators.

Emergency position-indicating radio beacon

Emergency radio beacon whose signal is relayed by an orbiting satellite to a monitoring station that identifies the beacon position.

Fast rescue boat

High speed (typically >20 knots), highly manoeuvrable boat, designed to rescue persons in distress and to marshal launched survival craft.

Note: Also referred to as “fast rescue craft” or “man overboard boat”. (See also “rescue boat”).

Float-free

Survival craft is automatically released from a sinking vessel or facility and is deployed ready for use.

Facility

Offshore floating structure designed for the extraction, processing and/or storage of hydrocarbons.

Examples: Monohulls (FPSOs), semi-submersibles, tension leg platform, etc.

Free-fall

Survival craft, with its complement of persons and equipment on board, is released from a stowage cradle and allowed to launch into the sea without any restraining apparatus.

Global maritime distress safety system/radio

An internationally mandated (SOLAS) set of safety procedures, types of radio equipment, and communication protocols used to increase safety and make it easier to rescue distressed vessels and aircraft.

Immersion suit

Protective suit for use in cold water, which reduces the body heat loss of a person wearing it.

Note: This may also be referred to as a “survival suit”.

Marine evacuation system

Appliance for the rapid transfer of persons from the embarkation deck of a vessel or facility to a floating survival craft.

Muster area

Designated area(s) for personnel to assemble in an emergency situation (maybe a protected area).

Note: Other commonly used names are “protected muster area” or “safe muster area”.

Rescue boat

Boat designed to rescue persons in distress and to marshal launched survival craft.

Note: Also referred to as the “man overboard boat” (MOB) or “fast rescue boat” (FRB).

Search and rescue transponder

Transponder used to locate a survival craft or distressed vessel by creating a series of dots on a rescuing vessel's radar display.

Survival craft

Craft which enable personnel survival after evacuation of the vessel or facility.

Note: For the purpose of this GP, “survival craft” includes all types of TEMPSC, lifeboat, life raft, and rescue boats that are deployed by crane, davit/winch, float-free, or under freefall.

TEMPSC

Totally-enclosed motor-propelled survival craft.

Note: Commonly known as a ‘lifeboat’.

Temporary refuge (TR)

A protected place where personnel can take refuge during a major incident for a pre-determined period whilst investigations, emergency response and evacuation pre-planning are undertaken.

Note: Also known as temporary safe area (TSA)/temporary safe refuge (TSR).

Example: Typically living quarters (LQ), protected lifeboat mustering area, etc.

Thermal protective aid

Bag or suit made of waterproof material with low thermal conductance.

Type approved

With reference to marine safety equipment “type approved” means that the item has been assessed by recognised International or National bodies as meeting the requirements of SOLAS or where SOLAS is not applicable, meeting the requirements of local legislation.

4. Symbols and abbreviations

For the purpose of this GP, the following symbols and abbreviations apply:

ADE	Above deck equipment.
EPIRB	Emergency position-indicating radio beacon.
FSA	Flag State Administration.
FRB	Fast rescue boat.
GMDSS	Global maritime distress safety system.
LSA	Live saving appliance.
MPI	Magnetic particle inspection (material testing).
NRB	National regulatory body.
RCS	Recognised classification society.
PFD	Personal flotation device.
POB	Personnel on board.
SART	Search and rescue transponder.
SME	Subject matter expert.
TEMPSC	Totally enclosed motor-propelled survival craft.
TLP	Tension leg platform.
TR	Temporary refuge.

5. General requirements for LSA

As a minimum, BP entities shall provide LSA to a facility in accordance with the requirements of SOLAS, the LSA Code, and as further specified within this GP.

5.1. Applicable LSA codes, standards, and regulations

Table 1 provides a matrix of IMO Codes, IMO Resolutions (including those of the Marine Safety Committee (MSC)), ISO standards, and other BP or internationally-recognised standards that should be used as an initial reference to the applicable clauses of those regulations concerning the provision of LSA.

Reference to Table 1 ensures that all LSA and associated equipment are properly considered during the Define stage of a project.

5.2. FSA and NRB requirements

- a. Dependent upon the geographical location of the facility and (if applicable) the routing of any wet delivery voyage(s) to the final location, the facility may require to be flagged with a FSA that may have additional requirements for LSA.
- b. BP entities shall comply with SOLAS and LSA Code, or NRB requirements for offshore facilities at the location, whichever is the higher.

Regulatory requirements usually depend upon the chosen FSA's interpretation and application of SOLAS, and may vary widely between countries.

In the absence of a local FSA the following bodies are considered by BP to have well developed requirements for the development of a project specification:

- UK - Health and Safety Executive and Maritime and Coastguard Agency.
- US - Code of Federal Regulations and US Coast Guard.
- Norway - NORSOK and Norwegian Maritime Directorate.
- Europe - Marine Equipment Directive for common standards of testing and inspection.

FSA and/or NRB often appoint a RCS as a Certifying Authority to act on their behalf.

- c. If there is an intention to operate the installation within the jurisdiction of more than one FSA and/or NRB, i.e., the facility is capable of being moved from one location to another, the applicable regulations from each FSA/NRB should be applied.

This needs to be considered if the installation may operate under more than one regulatory framework, such as when an FPSO disconnects from its turret mooring and changes from an offshore installation to a ship.

The life saving arrangements are initially documented in the LSA Plan which is approved by the applicable FSA; and therefore any subsequent changes or alterations need to be approved by the applicable FSA and a revised plan issued.

6. Personal LSA

6.1. General

- a. Personal LSAs including, but not limited to lifebuoys, life-jackets, immersion suits, anti-exposure suits, buoyant work vests, etc., shall be marked with the name of the facility to which they belong or comparable unique identifier.

Personal LSA may be contained within a grab bag stowed in each cabin.

- b. Any container designated for storing personal LSA shall be marked in block capital letters and numbers with the quantity, identity, and size of the equipment stowed inside the container. The equipment may be identified in words or with the appropriate symbol from IMO Resolution A.760 (18).
- c. When situating storage containers for personal LSA, the location should be protected from hazards such as green seas, dropped objects, thermal radiation, helicopter down draft, etc. Personal LSA and/or their storage containers shall be arranged such that they are easily accessible to personnel when assembling at emergency muster areas.

6.2. Lifebuoys

6.2.1. Type and quality of materials/components

- a. Lifebuoys shall be of the unicellular plastic construction.
- b. Lifebuoy lights shall be certified as intrinsically safe.
- c. Synthetic material buoyant lifelines should be certified by the manufacturer to be weather resistant and stabilized against the effects of heat, oxidation, and ultraviolet light degradation.

Performance standards for lifebuoys are specified in SOLAS and 46 CFR 160.050.

The requirement for unicellular construction is needed because USCG only accepts lifebuoys complying with 46 CFR 160.050.

6.2.2. Number required

- a. One lifebuoy shall be fitted at least every 50 m (160 ft) along the sides of the facility.
- b. For semi-submersible facilities and TLPs, at least two lifebuoys per side shall be fitted.
- c. Lifebuoys shall be equipped with self-igniting lights and, in addition, not less than 50% shall be fitted with a buoyant lifeline.

6.2.3. Location and orientation

Lifebuoys shall be provided and should be located as near to the waterline as practicable and should be capable of being easily released from an accessible location. A remote release capability should be considered.

6.3. Lifejackets and work vests

6.3.1. Non-inflatable lifejackets

6.3.1.1. Type and quality of materials/components

- a. Type approved (non-inflatable) lifejackets for offshore open ocean use shall be provided and should be compatible with the immersion suits and/or anti-exposure suits onboard, if they are intended to be worn together.

Performance standards for lifejackets are specified in MSC Resolution 81(70) - Part 1/2 and 2/2, and 46 CFR 160.052 and 160.055.

- b. If a facility is fitted with an escape chute (see 8.8), evacuation by chute shall be possible by personnel wearing their lifejackets.

6.3.1.2. Location and number required

- a. The facility shall be supplied with lifejackets, located within the accommodation area, e.g., in cabins and designated work station areas such as control rooms, in a quantity sufficient for at least 100% of the maximum number of POB.

- b. In addition to the accommodation quantity, all survival craft embarkation station(s) shall be supplied with lifejackets sufficient for 100% of the capacity of each survival craft at those station(s).
- c. Lifejackets stored at the survival and rescue craft embarkation stations, should be kept in dedicated containers/lockers, in a readily accessible location as close as practicable to the craft.

The effective over supply of lifejackets at craft embarkation stations, reflects an allowance for the possibility of personnel arriving at the station without a lifejacket from the accommodation.

6.3.2. Inflatable lifejackets

6.3.2.1. Type and quality of materials/components

Inflatable type lifejackets should be provided for rescue boat and marine evacuation system crew/operators and shall be type approved for offshore open ocean use.

Inflatable lifejackets are less bulky and easier to wear for personnel performing these duties.

Performance standards for inflatable lifejackets are specified in MSC Resolution 81(70) - Part 1/2 and 2/2, and 46 CFR 160.077 and 160.176.

6.3.2.2. Number required

Inflatable lifejackets, in an appropriate range of sizes, shall be provided for the number of personnel assigned to crew the fast rescue boat and/or assigned to the marine evacuation system operating crew.

6.3.2.3. Location and orientation

Inflatable lifejackets shall be located as close as practicable to the rescue boat and/or the marine evacuation system. They should be stored together with related equipment such as anti-exposure suits, crash helmets, and other rescue equipment, in a readily accessible location.

6.3.3. Buoyant work vests

6.3.3.1. Type and quality of materials/components

- a. Approved buoyant work vests should be provided for the use of crew members working near or over the water.
- b. Buoyant work vests (if provided) shall conform to the requirements of Type V PFDs.

Approved buoyant work vests, PFD, are often used on facilities by crew members working near or over the water and should be considered items of PPE/safety apparel.

Performance standards for buoyant work vests are specified in MSC Resolution 81(70) - Part 1/2 and 2/2 and 46 CFR 160.053.

6.3.3.2. Number required

- a. The number of work vests should be determined by operational requirements.
- b. Buoyant work vests shall not be accepted in lieu of any percentage of the required number of approved non-inflatable, or inflatable, lifejackets.

6.3.3.3. Location and orientation

Buoyant work vests shall be stowed separately from the approved lifejackets required by 6.3.1.1.