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CODE OF PRACTICE FOR THE EVALUATION, TESTING AND
ACCEPTANCE OF PROTOTYPE NOVEL LIFE-SAVING APPLIANCES
AND ARRANGEMENTS

THE ASSEMBLY,

RECALLING Article 16(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations concerning maritime safety,

RECOGNIZING that prototype novel life-saving appliances and arrangements may be developed which do not fully meet the requirements of chapter III of the 1983 amendments to the International Convention for the Safety of Life at Sea, 1974, but which will provide the same or higher safety standards,

CONSIDERING the need to provide a code of practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements to facilitate their acceptance by the Organization through amendment of chapter III of the International Convention for the Safety of Life at Sea,

NOTING regulation 4.3 of chapter III of the 1983 amendments to the International Convention for the Safety of Life at Sea, 1974,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its forty-eighth session,

1. ADOPTS the code of practice for the evaluation, testing and acceptance of prototype novel life-saving appliances and arrangements, set out in the Annex to the present resolution;
2. URGES Governments to ensure that prototype novel life-saving appliances and arrangements at least comply with the provisions of this Code of Practice;
3. REQUESTS the Maritime Safety Committee to keep this Code of Practice under review and to report as necessary to the Assembly.

ANNEX

CODE OF PRACTICE FOR THE EVALUATION, TESTING AND ACCEPTANCE OF PROTOTYPE NOVEL LIFE-SAVING APPLIANCES AND ARRANGEMENTS

PREAMBLE

Chapter III of the International Convention for the Safety of Life at Sea, 1974 (hereinafter referred to as "the Convention") was amended in 1983 by the Maritime Safety Committee by resolution MSC.6(48) to improve the standards of safety provided by life-saving appliances and arrangements on cargo ships and passenger ships, to make special provisions for certain types of cargo ships and to incorporate in the Convention life-saving appliances and arrangements which had been developed and accepted by Contracting Governments to the Convention (hereinafter referred to as "Contracting Governments") since 1974.

It is recognized that the design and introduction of prototypes of improved novel life-saving appliances and arrangements is desirable and should be encouraged.

Prototype life-saving appliances and arrangements meeting the requirements of chapter III of the Convention, as amended, should be evaluated and tested in accordance with the Recommendation on Testing of Life-Saving Appliances*.

Prototype life-saving appliances and arrangements not meeting all the requirements of chapter III of the Convention, as amended, should be evaluated and tested to ensure that such appliances and arrangements at least comply with the provisions of this Code of Practice before being accepted by a Contracting Government. Subsequently, provisions for such life-saving appliances and arrangements could be incorporated in chapter III, through the amendment procedure prescribed in the Convention.

A Contracting Government proposing novel life-saving appliances and arrangements for adoption in accordance with the amendment procedure should submit full details of such appliances and arrangements and the results of prototype tests to the Organization to indicate that they comply with the requirements of this Code of Practice and in particular:

- 1 provide all the functions of, and are equally effective as, the life-saving appliances and arrangements intended to be replaced; and
- 2 do not affect the proper operation of any other life-saving appliance or arrangement installed on the ship.

Nothing in this Code shall be construed as derogating from or extending the rights of Administrations under regulation 1/5 of the 1974 SOLAS Convention to allow the fitting or carriage of any prototype novel life-saving appliance or arrangement.

1 GENERAL PROVISIONS

1.1 Purpose

This Code prescribes the appliance and arrangement criteria which should be taken into account and prototype tests which should be carried out for the evaluation of novel designs for international acceptance through the amendment procedure of the Convention.

* Assembly resolution A.521(13).

1.2 Application

1.2.1 This Code applies to all prototype novel life-saving appliances and arrangements for which provisions have not been made in chapter III of the Convention, as amended, and for which Contracting Governments seek international acceptance.

1.2.2 Contracting Governments should apply the provisions of this Code when introducing equivalent life-saving appliances and arrangements pursuant to regulation I/5 of the Convention.

1.3 Definitions

1.3.1 The appropriate terms and definitions given in regulations I/2 and III/3 of the Convention, as amended, also apply to this Code. In addition, for the purpose of this Code unless expressly provided otherwise:

- .1 **Equivalent** means a particular fitting, material, appliance, apparatus or arrangement, or any combination of fittings, materials, appliances, apparatus or arrangements allowed by an Administration to be fitted or carried in a ship in substitution for any of the requirements of chapter III of the Convention.
- .2 **Prototype life-saving appliance or arrangement** is the first appliance or arrangement produced of a size and construction or performance characteristics differing from previous designs. If an appliance or arrangement is a modification of a previous design, only those characteristics affected by the modification are considered to be prototype characteristics which must be prototype tested.
- .3 **Prototype tests** are those tests to which a prototype life-saving appliance or arrangement is subjected in order to test features which cannot be considered by the Administration on the basis of reasonable extrapolation of previous test results or experience.
- .4 **Active survival craft** means a survival craft propelled by an engine.
- .5 **Passive survival craft** means a survival craft which is not propelled by an engine.

2 GENERAL CRITERIA

2.1 Operational readiness

2.1.1 The life-saving appliances on every ship should, either individually or collectively:

- .1 be safely stowed and in a state of readiness for immediate use;
- .2 provide means of abandonment of all persons on board in the shortest possible time; in the case of:
 - .2.1 passenger ships, within a period of 30 min; and
 - .2.2 any other ship, within a period of 10 min;
- .3 include portable buoyancy equipment for the support and detection of persons in the water. Such equipment should be:
 - .3.1 so distributed as to be readily available on both sides of the ship and as far as practicable on all open decks extending to the ship's side; at least one should be placed in the vicinity of the stern;
 - .3.2 stowed in conspicuous places and so that they can be readily cast loose; they should not be permanently secured; and
 - .3.3 fitted with suitable aids to assist detection;

- .4 include sufficient individual buoyancy equipment for every person on board and, in addition, sufficient additional equipment to replace equipment which may become inaccessible;
- .5 provide for the rescue and retrieval of persons in the water from survival craft or distressed ships;
- .6 not be rendered inoperable by the effects of the marine atmosphere, seawater, fresh water, oil or fungus; in addition, where exposed to sunlight, they should be resistant to deterioration;
- .7 not be damaged in stowage throughout an air temperature range from -30°C to $+65^{\circ}\text{C}$ and, if they are likely to be immersed in seawater during their use, be capable of operating throughout a seawater temperature range from -1°C to $+30^{\circ}\text{C}$, unless other temperature ranges are relevant;
- .8 on ships carrying hazardous cargo, provide protection for the crew from the effects of cargo hazards or fire during and after abandonment;
- .9 where practicable, be constructed of fire-retardant materials; however, their attachments, fittings or equipment need not be of fire-retardant material provided they do not affect the efficient functioning of the appliance;
- .10 be maintained and tested to ascertain that they meet the requirements of this Code.

2.1.2 Descriptions and instructions for operation, inspection, maintenance and functional testing should be provided for all the life-saving appliances, covering as appropriate the:

- .1 purpose;
- .2 operating description;
- .3 physical description;
- .4 operating instructions;
- .5 requirements for inspection, maintenance, replacements and specialist servicing;
- .6 requirements for operational testing, standards of performance, methods of adjustment; and
- .7 fault-finding procedures.

2.1.3 Posters and signs in the vicinity of appliances and controls should:

- .1 indicate the purpose of controls and procedures for operating the appliances or controls and give relevant instructions and warnings;
- .2 be easily seen under emergency lighting conditions.

2.1.4 Instructions should be provided for each crew member which include the operations to be performed in relation to life-saving appliances in emergencies.

2.1.5 Spares and repair equipment should be provided for life-saving appliances or parts of life-saving appliances which are subject to excessive wear or consumption.

2.1.6 Life-saving appliances should be easy to inspect, maintain and test and, where applicable, be serviced at an approved servicing station.

2.1.7 Life-saving appliances should be simple to operate and should be so constructed that crew members can be easily familiarized with their use during practice musters and drills and require minimum prior training or experience.

2.1.8 Survival craft with launching arrangements should be stowed or located so that:

- .1 neither the survival craft nor its stowage arrangements will interfere with the operation of any other survival craft or any other launching station;
- .2 they are as near sea level as is safe and practicable and the embarkation position is at least 2 m above the waterline with the ship trimmed up to 10° and listed up to 20° either way, in the fully loaded condition, or to the angle at which the ship's weather deck edge becomes submerged, whichever is the least;
- .3 boarding and launching can take place:
 - .3.1 in cargo ships, directly from the stowed position and in the case of passive survival craft provided with launching devices, from a position immediately adjacent to the stowed position or from a position to which the survival craft is transferred prior to launching;
 - .3.2 in passenger ships, either directly from the stowed position or from an embarkation deck but not both and, in the case of passive survival craft provided with launching devices, from a position immediately adjacent to the stowed position or from a position to which the survival craft is transferred prior to launching;
- .4 they are kept in a state of continuous readiness and so that two crew members can carry out preparations for boarding and for launching in less than 5 min;
- .5 after being prepared for boarding, they may be boarded in the case of:
 - .5.1 passenger ships, rapidly;
 - .5.2 cargo ships, in not more than 3 min;
- .6 with the exception of that equipment which may be stowed in another location to protect it from pilferage or deterioration, they are fully equipped with all systems and components required for safe operation;
- .7 when the survival craft are launched by falls or a fall and are not the additional survival craft provided on passenger ships, they are attached to their launching devices or within reach of the lifting hooks unless rapid and efficient means of transfer are provided which will not:
 - .7.1 be rendered inoperable under the conditions prescribed in paragraph 2.2.1 or by ship motion;
 - .7.2 reduce the time for preparing and boarding the survival craft prescribed in paragraphs 2.1.8.4 and 2.1.8.5;
- .8 if arranged for throw-over launching, unless an adequate capacity of survival craft is available on both sides, the survival craft can readily be transferred for launching on either side of the ship;
- .9 they are, as far as practicable, in a secure and sheltered position and protected from damage by fire and explosions.

2.1.9 Survival craft embarkation and launching arrangements should be provided except for those survival craft which are portable and are:

- .1 boarded from a position on deck less than 4.5 m above the waterline in the lightest seagoing condition; or
- .2 carried in excess of 200% of the number of persons on board.

2.1.10 Rescue craft should be stowed in such a way that:

- .1 they are kept in a state of continuous readiness and can be launched within 5 min;
- .2 neither the rescue craft nor its stowage arrangements will interfere with the operation of any survival craft at any other launching station.

2.1.11 Means for individual abandonment should:

- .1 enable unassisted descent from deck to the water surface;
- .2 be stowed in conspicuous and accessible locations ready for use:
 - .2.1 in the vicinity of survival craft launching areas; and
 - .2.2 in areas where persons may be isolated from survival craft due to fire or explosions.

2.1.12 Facilities should be provided for alerting all persons on board.

2.2 Abandonment

Abandonment should be possible:

- .1 with the ship trimmed up to 10° and listed up to 20° either way or up to such angles of trim or list at which the ship's weather deck edge becomes submerged, whichever is the least and on oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto and the recommendations of the Organization* as applicable, at the final angle of heel on the lower side;
- .2 with the ship adrift in a seaway;
- .3 in case of cargo ships of 20,000 gross tonnage and upwards, with the ship making way at speeds up to 5 knots in calm water;
- .4 without depending upon any means other than gravity or stored power which is independent of the ship's power supplies to launch the survival craft.

2.3 Survival

2.3.1 Survival craft systems should:

- .1 provide subsistence and protection for their complement under adverse weather conditions;
- .2 have the capability of manoeuvring in a seaway.

2.3.2 Rescue craft should:

- .1 provide protection for their complement under adverse weather conditions;
- .2 have the capability of manoeuvring in a seaway.

* Reference is made to the damage stability requirements of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

2.4 Detection

2.4.1 Visual means of detection for survival craft should make it possible:

- .1 for an aircraft at an altitude of up to 3,000 m to detect the survival craft at a range of at least 10 miles; and
- .2 for a ship to detect the survival craft in a seaway in clear conditions at a range of at least 2 miles.

2.4.2 Visual means of detection for persons in the water should make it possible for a ship to detect the person in a seaway:

- .1 in clear daytime conditions at a range of at least 0.2 miles;
- .2 in clear night-time conditions at a range of at least 0.5 miles for a duration of at least 8 h.

2.5 Retrieval

2.5.1 Survival craft should:

- .1 if passive, be capable of being towed at speeds of up to 3 knots;
- .2 if active, be capable of being towed at speeds of up to 5 knots and be capable of towing other survival craft;
- .3 permit a person to transfer from the survival craft in a seaway to a ship or helicopter.

2.5.2 Rescue craft should be capable of being towed at speeds of up to 5 knots and be capable of towing a survival craft.

2.5.3 Launching arrangements for rescue craft should provide safe launching from the ship in a seaway with the ship making way at speeds of up to 5 knots.

2.5.4 Retrieval arrangements for rescue craft should permit rapid recovery of the rescue craft with its rescue craft complement of at least six persons and equipment in a seaway.

3 APPLIANCE CRITERIA AND TESTING OF PROTOTYPES

3.1 Personal life-saving appliances

3.1.1 Buoyancy equipment intended to support and enable detection of persons in the water should:

- .1 where required to be fitted with a buoyant lifeline, have a lifeline equal in length to at least twice the height at which it is stowed above the waterline in the lightest seagoing condition, or 30 m, whichever is the greater;
- .2 be constructed to withstand a drop from the height at which it is stowed above the lightest seagoing waterline, or 30 m, whichever is the greater, without impairing its operating capability or that of its attached components;
- .3 be capable of supporting not less than 14.5 kg of iron in fresh water for a period of 24 h;
- .4 have means to enable persons to cling to the equipment;

- .5 not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .6 where required, be sufficiently heavy to operate release arrangements of the attached means of detection;
- .7 be prototype tested with regard to paragraphs 3.1.1.2 to 3.1.1.6;
- .8 where required, be provided with means of detection, complying with the requirements of paragraph 3.7.1.

3.1.2 Individual buoyancy equipment should:

- .1 be so designed that after a demonstration a person can correctly don the equipment within a period of 1 min without assistance;
- .2 not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;
- .3 be possible to wear without undue discomfort during abandonment and within a survival craft;
- .4 if inflatable, inflate automatically upon immersion and be capable of being inflated manually and by mouth;
- .5 if inflatable, perform effectively with any one buoyancy compartment inoperative;
- .6 allow the wearer to jump into the water from a height of at least 4.5 m without sustaining injury and without dislodging or damaging the equipment;
- .7 allow swimming and boarding of a survival craft in a seaway;
- .8 in calm fresh water, be capable of lifting the mouth of a completely relaxed person wearing normal clothing at least 120 mm clear of the water;
- .9 in calm fresh water, be capable of turning a completely relaxed person wearing normal clothing from any position in the water to one where the mouth is clear of the water within 5 s;
- .10 have buoyancy which is not reduced by more than 5% after a 24 h period of submersion in fresh water;
- .11 be prototype tested with regard to paragraphs 3.1.2.1 to 3.1.2.10 and with regard to paragraph 3.1.2.7 in a seaway;
- .12 be provided with means of detection complying with paragraph 3.7.2; however, equipment provided on passenger ships on short international voyages need not comply with paragraph 3.7.2.2.

3.1.3 Individual garments for protection against hypothermia should:

- .1 be so designed that after a demonstration a person can without assistance unpack and correctly don the garment and any required additional individual buoyancy equipment and clothing, within a period of 2 min, taking into account possible low ambient temperature conditions;
- .2 not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s;

- .3 not cause undue discomfort to the wearer during abandonment or in survival craft and permit the person wearing it and any additional individual buoyancy equipment and any associated clothing to:
 - .3.1 perform normal duties during abandonment;
 - .3.2 climb up and down a ladder at least 5 m in length;
 - .3.3 jump vertically into the water from a height of at least 4.5 m without sustaining injury, dislodging or causing damage to the garment or allowing undue ingress of water;
- .4 allow a person wearing the garment and any required additional individual buoyancy equipment to swim and board a survival craft in a seaway;
- .5 in calm fresh water, in conjunction with any required additional individual buoyancy equipment, be capable of lifting the mouth of a completely relaxed person wearing the garment at least 120 mm clear of the water;
- .6 in calm fresh water permit a person wearing the garment and any required additional individual buoyancy equipment to turn from any position to one where the mouth is clear of the water in not more than 5 s;
- .7 if provided with buoyancy, not suffer a loss of buoyancy of more than 5% after a 24 h period of submersion in fresh water;
- .8 be prototype tested with regard to paragraphs 3.1.3.1 to 3.1.3.7 and with regard to paragraph 3.1.3.4 in a seaway;
- .9 if meant to be worn without additional buoyancy equipment or on top of such equipment, be provided with means of detection complying with paragraph 3.7.2.

3.1.4 In addition to meeting paragraph 3.1.3, an individual garment for long-term immersion should:

- .1 when used over light clothing and with any required additional individual buoyancy equipment, allow the wearer following one jump into the water from a height of 4.5 m to float in calm circulating water of between 0°C and 2°C for a period of 6 h during which period the wearer's body core temperature should not fall more than 2°C;
- .2 permit the wearer, on completion of the above test, to be able to pick up a pencil and write;
- .3 be prototype tested with regard to paragraphs 3.1.4.1 and 3.1.4.2.

3.1.5 In addition to meeting paragraph 3.1.3, an individual garment for short-term immersion should:

- .1 when worn in conjunction with warm clothing and any required additional individual buoyancy equipment, following one jump by the wearer into the water from a height of 4.5 m, continue to provide sufficient thermal protection to ensure that when worn for a period of 1 h in calm circulating water at a temperature of 5°C the wearer's body core temperature should not fall more than 2°C;
- .2 permit the wearer, on completion of the above test, to be able to pick up a pencil and write;
- .3 be prototype tested with regard to paragraphs 3.1.5.1 and 3.1.5.2.

3.2 Survival craft

3.2.1 Survival craft should:

- .1 where arranged to be suspended by falls and lowered to the water by means of a launching device, be of sufficient strength to withstand:
 - .1.1 if rigid, an overload of 100% of the total mass of the survival craft when loaded with its full complement of persons and equipment, without suffering significant residual deflection on removal of that load, except that in the case of a survival craft constructed of metal, the overload should be 25%;
 - .1.2 if inflatable, a load of 4 times the mass of its full complement and equipment at an ambient temperature of +20°C without pressure relief of inflated compartments, and a load of 1.1 times the mass of its full complement and equipment at an ambient temperature of -30°C;
 - .1.3 when fully loaded without sustaining damage that would affect its efficient functioning
 - a sideways impact against a rigid vertical surface at an impact velocity of at least 3.5 m/s; and
 - a drop into the water from a height of 3 m;
- .2 in the case of a self-righting partially enclosed and totally enclosed survival craft, protect its occupants when subjected to the sideways impact referred to in paragraph 3.2.1.1.3;
- .3 if inflatable:
 - .3.1 withstand an inflation test pressure of at least 3 times the working pressure and be so arranged that the pressure cannot exceed twice the working pressure; and
 - .3.2 inflate with a non-toxic gas within a period of one min at an ambient temperature between 18°C and 20°C and within a period of 3 min at an ambient temperature of -30°C;
- .4 where arranged for free-fall launching, have sufficient strength and diving characteristics to withstand a fall into the sea from the maximum height at which it is designed to be stowed, taking into account unfavourable conditions of trim up to 10° and a list up to 20° either way, without impairing its operating capabilities or causing injury to its occupants;
- .5 where required to float free, be stowed in such a manner as to permit it to float free from its stowage and break free from the ship in an operational condition when the ship sinks;
- .6 if inflatable, withstand repeated jumps on to it from a height of at least 4.5 m above the water;
- .7 be approved for the maximum number of persons it is permitted to accommodate, as decided by practical seating tests afloat and based upon the number of adult persons wearing individual buoyancy equipment who can be seated without in any way interfering with the normal operation of its equipment or means of propulsion;
- .8 when prepared for launching, permit its full complement of persons excluding any stretcher cases to board rapidly and in the case of cargo ships in not more than 3 min from the time the instruction to board is given;
- .9 permit embarkation of stretcher cases;

- .10 have arrangements to secure it to the ship by a painter of adequate strength and of a length equal to at least twice the distance from its stowed position to the lightest seagoing waterline or 15 m, whichever is the greater;
- .11 in the case of a self-righting partially enclosed or totally enclosed survival craft, unless capable of operating safely in the upside-down position, have such strength and stability that it is inherently or automatically self-righting when all entrances and openings are closed watertight, all equipment is secured and the full complement of persons are secured to their seats with safety belts;
- .12 in the case of a passive survival craft, unless capable of operating safely in the upside-down position, have such sufficient strength and stability that:
 - .12.1 it is self-righting; or
 - .12.2 it can be readily righted, in a seaway, by one person unassisted;
- .13 when fully or partly loaded maintain its operational effectiveness when drifting in a seaway;
- .14 have sufficient buoyancy to support its full complement even when holed in any one location below the waterline without loss of buoyancy material or other damage, to automatically or inherently attain a position which provides an above-water escape for its occupants;
- .15 have a freeboard, measured from the waterline to the lowest opening through which the survival craft may become flooded, of not less than 1.5% of the survival craft's length when loaded with one half of its full complement seated to one side of the centreline;
- .16 be provided with effective means for bailing or be self-bailing in a seaway, but self-righting partially enclosed survival craft should be automatically self-bailing in a seaway;
- .17 provide protection for its complement against wind, rain and spray, adequate ventilation and protection for its complement at all ambient temperatures between -15°C and $+30^{\circ}\text{C}$;
- .18 be designed with due regard to the safety of persons on board with regard to slippery or hot surfaces and sharp edges;
- .19 be possible to manoeuvre;
- .20 provide means for persons in the water to cling to the survival craft;
- .21 permit persons to board the survival craft from the water when wearing individual buoyancy equipment;
- .22 permit those on board the survival craft, when wearing individual buoyancy equipment, to recover persons from the water without their assistance;
- .23 be provided with manually controlled lighting sufficient to permit reading of instruction material and to facilitate operations at night with a power capacity sufficient for at least 12 h;
- .24 carry provisions, water and equipment for the full complement;
- .25 be of sufficient strength and have sufficiently strong fixtures and painters to be:
 - .25.1 towed at speeds up to 3 knots in the case of passive survival craft;

- .25.2 towed at all speeds up to 5 knots in the case of active survival craft;
- .25.3 launched with the ship making headway at speeds up to 5 knots in the case of active survival craft intended for use on cargo ships of 20,000 gross tonnage and upwards;
- .26 have means of permitting watertight restowage, where equipment is required to be stowed in watertight containers;
- .27 be so arranged that in a seaway, a person in the survival craft may be picked up by helicopter or transferred to a ship by ladder or net without assistance from other persons in the survival craft;
- .28 be prototype tested with regard to paragraphs 3.2.1.1 to 3.2.1.6, 3.2.1.8 to 3.2.1.12, 3.2.1.14, 3.2.1.15, 3.2.1.17, 3.2.1.19 to 3.2.1.23 and 3.2.1.25 and with regard to paragraphs 3.2.1.7 and 3.2.1.16 in a seaway;
- .29 be provided with means for location and detection complying with paragraphs 3.7.4.

3.2.2 In addition to meeting the requirements of paragraph 3.2.1, active survival craft should:

- .1 have a means of propulsion, capable of being started manually or by two independent power sources and operated at an ambient temperature of -15°C within 2 min of commencing the engine start procedure using if necessary starting aids, unless, having regard to the particular voyages in which the ship carrying the craft is constantly engaged, another minimum starting and operating temperature is appropriate;
- .2 if self-righting partially enclosed or totally enclosed, have a means of propulsion capable of running in the inverted position during capsize of the survival craft and of continuing to run after returning to the upright position unless it is stopped automatically when inverted and is easily restarted after the survival craft has returned to the upright position and, in the case of a self-righting partially enclosed survival craft, the water has drained from the survival craft. Capsizing should not cause a significant spill of oil into the survival craft;
- .3 have sufficient mobility and manoeuvrability in a seaway to allow retrieval of persons from the water, marshalling of passive survival craft and to allow the largest passive survival craft carried on the ship to be towed at a speed of 2 knots in calm water;
- .4 be capable of maintaining a speed of at least 6 knots for at least 24 h;
- .5 be designed with due regard to the safety of persons in the water and the possibility of damage to the propulsion system by floating debris;
- .6 be prototype tested with regard to paragraphs 3.2.2.1, 3.2.2.2 and 3.2.2.4 and with regard to paragraph 3.2.2.3 in a seaway.

3.2.3 In addition to meeting the requirements of paragraphs 3.2.1 and 3.2.2, a survival craft with a self-contained air support system should:

- .1 be capable of proceeding at maximum power for at least 10 min without exposing its complement to harmful gases or creating a subatmospheric pressure within the survival craft;
- .2 be prototype tested with regard to paragraph 3.2.3.1 by running the survival craft for at least 10 min while maintaining an overpressure within the survival craft of not more than 20 mbar.

3.2.4 In addition to meeting the requirements of paragraphs 3.2.1, 3.2.2 and 3.2.3, fire-protected survival craft should be prototype tested by enveloping the survival craft with its means of propulsion running in a fire for a period of at least 8 min during which time there should be no ingress of harmful fumes and habitable temperatures should be maintained within the survival craft.

3.3 Rescue craft

Rescue craft should comply with the provisions of paragraphs 3.2.1.1.1, 3.2.1.4, 3.2.1.11, 3.2.1.13, 3.2.1.15 to 3.2.1.18, 3.2.1.20 to 3.2.1.22, 3.2.1.25.2, 3.2.1.29, 3.2.2.1, 3.2.2.3 and 3.2.2.5, and in addition should:

- .1 where arranged to be suspended by a fall or falls and lowered to the water by means of a launching device, be of sufficient strength and fendered to withstand:
 - .1.1 if inflated, a load of 4 times the mass of the rescue boat and its full complement of persons and equipment at an ambient temperature of 20°C with all relief valves inoperative and 1.1 times the mass of the rescue boat and its full complement of persons and equipment at an ambient temperature of -30°C with all relief valves operative;
 - .1.2 when fully loaded, without sustaining damage that would affect its efficient functioning:
 - a sideways impact against a rigid vertical surface with an impact velocity of at least 3.5 m/s; and
 - a drop into the water from a height of 3 m;
- .2 be capable of carrying at least five persons seated and at least one person lying down;
- .3 be approved for the maximum number of persons to be decided by practical seating tests in a seaway and based upon the number of adult persons wearing individual buoyancy equipment who can be seated without in any way interfering with the normal operation of its equipment or means of propulsion;
- .4 when preparing for launching, permit its full complement of persons, excluding any stretcher cases, to board in not more than 3 min;
- .5 have sufficient buoyancy and stability to support its full complement even when holed in any one location and open to the sea;
- .6 offer protection against exposure to sea spray;
- .7 be capable of maintaining a speed of at least 6 knots for at least 4 h in a seaway;
- .8 be prototype tested with regard to paragraphs 3.2.1.1.1, 3.2.1.4, 3.2.1.16, 3.2.1.22, 3.2.2.1, 3.2.2.3, 3.3.1.1, 3.3.1.2, 3.3.2 to 3.3.4, 3.3.6 and 3.3.7 and with regard to paragraphs 3.2.1.11, 3.2.1.13, 3.2.1.18, 3.2.1.20, 3.2.1.25.2, 3.2.1.29, and 3.3.5 in a seaway.

3.4 Launching arrangements

3.4.1 Launching arrangements for survival craft should:

- .1 provide safe launching under normal conditions and with the ship trimmed up to 10° and listed up to 20° either way or up to such angles of trim or list at which the ship's weather deck edge becomes submerged, whichever is the least, and on oil tankers, chemical tankers and gas carriers with a final angle of heel greater than 20° calculated in accordance with the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the 1978 Protocol relating thereto and the recommendations of the Organization* as applicable, at the final angle of heel on the lower side;

* Reference is made to the damage stability requirements of the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) adopted by the Maritime Safety Committee by resolution MSC.4(48) and the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) adopted by the Maritime Safety Committee by resolution MSC.5(48).

- .2 in the case of cargo ships of 20,000 gross tonnage and upwards, provide safe launching with the ship making headway at speeds of up to 5 knots;
- .3 where they include falls and a winch, ensure that the speed at which the survival craft is lowered into the water is controlled by suitable means and such that the rate of descent after initial acceleration is at least a rate obtained from the formula:
$$S = 0.4 + (0.02 \times H)$$
where S = speed of lowering in metres per second
and H = height in metres from the uppermost point of suspension to the water-line in the lightest seagoing condition;
- .4 meet the requirements of the Administration for the maximum lowering speed of the survival craft to ensure the protection of its occupants from excessive forces and to prevent damage to the launching arrangements taking into account inertial forces during an emergency stop;
- .5 except for winch brakes, be of sufficient strength to withstand a static load of at least 2.2 times their maximum working load;
- .6 where they include winch brakes, have winch brakes of sufficient strength to withstand:
 - .6.1 a static test with a proof load of 1.5 times the maximum working load;
 - .6.2 a dynamic test with a proof load of not less than 1.1 times the maximum working load at maximum lowering speed;
- .7 be capable of being actuated by one person from a position on board the survival craft and from a position on deck from which the launching can be observed and the release of the survival craft from the launching arrangements should be possible from a position on board the survival craft;
- .8 if based on launching by a fall or falls, have a release mechanism which will release the survival craft into the water without causing damage to the survival craft;
- .9 if for float-free release:
 - .9.1 release the survival craft from its stowed position;
 - .9.2 be designed to minimize the possibility of the survival craft becoming fouled in davits, cranes, rigging or superstructure;
 - .9.3 not be released unintentionally by such forces as water on deck and heavy weather;
 - .9.4 not be affected by shipboard vibration;
 - .9.5 provide for manual release;
 - .9.6 of survival craft having a rigid enclosure, release and launch the survival craft in all conditions of loading without it becoming swamped and should in addition allow the release and launch of the survival craft from the operator's position within the survival craft;
- .10 if arranged for free-fall launching, ensure that the survival craft is released clear of the ship;
- .11 ensure that the survival craft is upright in the water after launching into a seaway, unless the survival craft is self-righting, may be used in the upside-down condition or can be righted by one person in the water;

- .12 be prototype tested with regard to paragraphs 3.4.1.2 to 3.4.1.11 and with regard to paragraph 3.4.1.1 in a seaway.

3.4.2 Launching arrangements for rescue craft should comply with the provisions of paragraphs 3.4.1.3 to 3.4.1.7, 3.4.1.10 and in addition should:

- .1 provide safe launching when the ship is:
 - .1.1 in a seaway; and
 - .1.2 making headway at speeds of up to 5 knots;
- .2 if based on launching by a fall or falls, have a release mechanism which will release the rescue craft into the water without causing damage to the rescue craft or injury to its complement; and
- .3 be prototype tested with regard to paragraphs 3.4.1.3 to 3.4.1.7, 3.4.1.10, 3.4.2.1 and 3.4.2.2 and with regard to paragraph 3.4.2.1.1 in a seaway.

3.5 Retrieval arrangements

3.5.1 Retrieval arrangements for active survival craft should:

- .1 provide for safe retrieval of the survival craft in a seaway;
- .2 return the survival craft to its position of stowage and readiness for use;
- .3 be of sufficient strength to withstand a static load of at least 2.2 times its working load except for winch brakes which should withstand a static load of 1.5 times the maximum working load;
- .4 be prototype tested with regard to paragraphs 3.5.1.2 and 3.5.1.3 and with regard to paragraph 3.5.1.1 in a seaway.

3.5.2 Retrieval arrangements for rescue craft should:

- .1 provide for safe retrieval of the craft in a seaway;
- .2 provide a retrieval speed of at least 0.3 m/s when loaded with its rescue craft complement of at least six persons and equipment;
- .3 return the craft to its position of stowage and readiness for use;
- .4 be of sufficient strength to withstand a static load of at least 2.2 times its working load except for the winch brakes which should withstand a static load of 1.5 times the maximum working load;
- .5 be prototype tested with regard to paragraphs 3.5.2.2 to 3.5.2.4, and with regard to paragraph 3.5.2.1 in a seaway.

3.6 Means of passing a line

3.6.1 Means of passing a line from the ship should:

- .1 be capable of throwing a line with reasonable accuracy over a distance of at least 230 m; and
- .2 be prototype tested with regard to paragraph 3.6.1.1.

3.7 Communications (alerting and detection)

3.7.1 Buoyancy equipment intended to support and enable detection of persons in the water should:

- .1 if required, have active means of detection attached which is automatically activated when the buoyancy equipment is released and makes it possible to detect the buoyancy equipment in a seaway visually from a ship at a range of at least 1 mile for a period of:
 - .1.1 at least 15 min under clear daytime conditions; and
 - .1.2 at least 2 h under clear night-time conditions;and when carried on tankers, such active means of detection should be of a type which cannot cause ignition of flammable vapours;
- .2 have passive means of detection which makes it possible to detect the buoyancy equipment in a seaway visually from a ship at a range of at least 0.3 miles under clear daytime conditions and, when illuminated by a searchlight, from a range of at least 0.3 miles under clear night-time conditions;
- .3 identify the ship on which it is carried;
- .4 be prototype tested with regard to paragraph 3.7.1.1 and with regard to paragraphs 3.7.1.1.1, 3.7.1.1.2 and 3.7.1.2 in a seaway.

3.7.2 Individual buoyancy equipment and garments for protection against hypothermia should:

- .1 have a manually controlled active means of detection which makes it possible to detect a person in a seaway audibly at a range of at least 0.2 miles in calm weather;
- .2 have active means of detection which makes it possible to detect a person in a seaway visually at a range of at least 0.5 miles under clear night-time conditions for a period of not less than 8 h;
- .3 have passive means of detection which makes it possible to detect a person in a seaway visually from a ship at a range of at least 0.2 miles under clear daytime conditions and, when illuminated by a searchlight, from a range of at least 0.2 miles under clear night-time conditions; and
- .4 be prototype tested with regard to paragraph 3.7.2.1 and with regard to paragraphs 3.7.2.2 and 3.7.2.3 in a seaway.

3.7.3 Survival craft should:

- .1 have active means of detection which makes it possible to visually locate or detect the survival craft in a seaway from a ship or an aircraft, as appropriate:
 - .1.1 at an altitude of 3,000 m at a range of at least 10 miles under clear daytime and night-time conditions for a period of at least 40 s;
 - .1.2 at a range of at least 3 miles under clear night-time conditions for a period of at least 1 min;
 - .1.3 at a range of at least 2 miles under clear daytime conditions for a period of at least 3 min;
 - .1.4 at a range of at least 2 miles under clear night-time conditions, which means should be manually operated, have sufficient capacity for at least 12 h operation and, in the case of passive survival craft, should be automatically activated when launched;

- .2 have passive means of detection which makes it possible to locate and detect the survival craft in a seaway visually from a ship at a range of at least 1 mile in clear daytime conditions and, when illuminated by a searchlight, under clear night-time conditions;
- .3 identify the ship on which they are carried;
- .4 be provided with items that are prototype tested with regard to paragraphs 3.7.3.1 and 3.7.3.2 in a seaway.

3.7.4 Rescue craft should:

- .1 have active means of detection which makes it possible to detect the rescue craft in a seaway from the ship on which they are carried, visually at a range of at least 2 miles under clear daytime and night-time conditions;
- .2 have passive means of detection which makes it possible to detect the rescue craft in a seaway visually from the ship on which they are carried at a range of at least 1 mile under clear daytime conditions and, when illuminated by a searchlight, under clear night-time conditions;
- .3 identify the ship on which they are carried;
- .4 be provided with items that are prototype tested with regard to paragraphs 3.7.4.1 and 3.7.4.2 in a seaway.

3.7.5 The ship should be provided with active means of detection which makes it possible to detect and locate the ship from an altitude of at least 3,000 m at a range of at least 10 miles under clear daytime and night-time conditions for a period of at least 40 s.

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