



RULES FOR BUILDING AND CLASSING

**HIGH SPEED CRAFT
JANUARY 2019**

**PART 5
SPECIALIZED CRAFT AND SERVICES**

American Bureau of Shipping
Incorporated by Act of Legislature of
the State of New York 1862

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1701 City Plaza Drive
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PART
5

Specialized Craft and Services

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CHAPTER **1** **Craft Intended to Carry Passengers**

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CHAPTER **1** **Craft Intended to Carry Passengers**

SECTION **1** **General**

1 **Application**

These requirements are intended to apply to a craft of Category A or Category B of the International Code for Safety for High-Speed Craft, carrying more than twelve passengers on an international voyage.

3 **Classification**

In accordance with 1-2-2/1, either the classification of **A1 HSC Passenger Craft (A)** or **A1 HSC Passenger Craft (B)** is to be assigned to craft designed and specifically fitted for the carriage of passengers and built to the applicable requirements of this section and other relevant sections of these Rules. In addition, the craft is to have a Safety Certificate for High-Speed Craft from the Administration of registry or its agent evidencing the craft compliance with the requirements of the International Code for Safety for High-Speed Craft (IMO HSC Code).

5 **Scope**

This section is intended to cover the additional hull construction, accommodation arrangement, machinery and safety equipment required to class a craft as a passenger craft. These requirements are applicable to those features that are permanent in nature and can be verified by plan review, calculation, physical survey or any other means. These Rules do not address the requirements for Life Saving Appliances and Arrangements (Chapter 8), Navigational Equipment (Chapter 13), Radio Communications (Chapter 14), and Operational Requirements (Chapter 18) found in the International Code for Safety for High-Speed Craft, which are not a condition for classification.

For a passenger craft intended for international voyage which is beyond the scope of the International Code for Safety for High-Speed Craft, the arrangements and scantlings are to comply with the requirements of Part 4, Chapter 8 of the *Steel Vessel Rules*.

For a passenger craft intended for service in domestic waters, the additional hull construction, accommodation arrangement, machinery and safety equipment requirements in this section may be replaced with the Regulations of the flag Administration for a craft intended solely for service in domestic waters.

7 **Safety Certificate for High-Speed Craft**

Where authorized by the Administration of country signatory to the International Convention for the Safety of Life at Sea, 1974 as amended, and upon request of the owners of a classed craft or one intended to be classed, ABS will review the plans, data, etc., and survey the craft for compliance with the requirements of the International Code for Safety for High-Speed Craft and issue a Safety Certificate for High-Speed Craft, prescribed in the Convention on behalf of the Administration.

9 **Independent Review**

When the Safety Certificate for High-Speed Craft is issued by an Administration or its agent other than ABS, ABS when requested by the owner, shipyard, or designers, will conduct an independent review of any of the following:

- Subdivisions and Stability

- Trim and Stability Booklet
- Inclining Experiment
- Structural Fire Protection
- Life-Saving Appliances and Arrangements

Fees for such independent reviews will be charged to the owner when the review is requested.

11 Administration Approval

In general, the approval of material for use in accommodation, safety equipment, life-saving appliances, etc., is a function of the Administration. When the craft is issued a Passenger Ship Safety Certificate by the Administration or its agent other than ABS, such certificate will be accepted as evidence that the Administration has approved the material, safety equipment, life-saving appliances, etc.

On other passenger craft, the designer or builder will submit evidence that the Administration has approved the material, safety equipment, life-saving appliances, etc. for ABS acceptance on craft building to class.

When given specific instructions from the Administration, ABS may approve and accept the material, equipment, life-saving appliances, etc. fitted on the craft.

13 Definitions

13.1 General

For definitions of terms used in this section and not shown below, reference is to be made to the definitions in the various Chapters in the International Code of Safety for High-Speed Craft. (Abbreviated: IMO HSC Code).

13.3 Administration

Administration means the Government of the State whose flag the craft is entitled to fly.

13.5 Category A Craft

Any high-speed passenger craft carrying not more than 450 passengers and operating on a route where it has been demonstrated to the satisfaction of the flag and port States that there is a high probability that, in the event of an evacuation at any point of the route, all passengers and crew can be rescued safely within the least of : a) the time to prevent persons in survival craft from exposure causing hypothermia in the worst intended conditions, b) the time appropriate with respect to environmental conditions and geographical features of the route, or c) 4 hours.

13.7 Category B Craft

Any high-speed passenger craft, other than a category A craft, with machinery and safety systems arranged such that, in the event of damage disabling any essential machinery and safety systems in one compartment, the craft retains the capability to navigate safely.

13.9 Crew Accommodations

Crew accommodations are those spaces allocated for the use of the crew, and include cabins, sick bays, offices, lavatories, lounges and similar spaces.

13.11 Passenger

A passenger is every person other than, a) the master and members of the crew or other persons employed or engaged in any capacity on board a craft on the business of that craft and b) a child under one year of age.

13.13 Public Space

Public spaces are those spaces allocated for the passengers and include bars, kiosks, smoke rooms, main seating areas, lounges, dining rooms, recreation rooms, lobbies, lavatories and similar permanently enclosed spaces allocated for passengers.

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CHAPTER 1 Craft Intended to Carry Passengers

SECTION 2 Stability

1 Intact Stability

The intact stability for passenger craft, in the displacement mode, in the transient mode and in the non-displacement mode are to comply with a recognized standard. The submission of evidence showing approval by an Administration will be acceptable. Alternatively, upon request the review will be performed by ABS for compliance with the applicable requirements of the IMO HSC Code.

3 Subdivision and Damage Stability

When the craft is issued a Safety Certificate for High-Speed Craft by the Administration or its agent other than ABS, such certificate will be accepted as evidence of compliance with the subdivision and stability requirements of Chapter 2.6 of the IMO HSC Code. On all other passenger craft, when authorized by an Administration and requested by the Owner, ABS will review the data on the subdivision and stability for compliance with the IMO HSC Code on behalf of the Administration. However, also see 5-1-1/9.

5 Inclining Experiment and Stability Information

When the craft is issued a Safety Certificate for High-Speed Craft by the Administration or its agent other than ABS, such certificate will be accepted as evidence of compliance with the requirement for an inclining experiment and stability information of Chapter 2.7 of the IMO HSC Code. On all other passenger craft, when authorized by an Administration and requested by the Owner, ABS will review the inclining experiment and stability information for compliance with the IMO HSC Code on behalf of the Administration. However, also see 5-1-1/9.

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SECTION **3** **Construction**

1 **General**

The scantlings and arrangements of the hull structure are to be in accordance with the applicable requirements of Part 3.

3 **Accommodation Space Design**

Passenger and crew accommodation spaces are to be designed and arranged so that the occupants are protected from unfavorable environmental conditions, and the risk of injury to occupants during normal and emergency conditions is minimized. Spaces accessible to passengers are not to contain controls, electrical equipment, high-temperature parts and pipelines, rotating assemblies, or other items from which injury to passengers could result, unless such items are adequately shielded, isolated, or otherwise protected.

The design and location of public spaces and crew accommodation may be in accordance with the requirements in 5-1-A1, “Guidelines for Accommodation Design of Passenger Craft” unless the flag Administration has specific requirements in this respect.

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CHAPTER **1** **Craft Intended to Carry Passengers**

SECTION **4** **Bilge System**

1 **General**

The bilge system is to comply with 4-4-3/1 through 4-4-3/7 except as modified below. Suitable arrangements are to be provided for the drainage and discharge of water which may be discharged by the fixed sprinkler system in 5-1-5/3.

3 **Bilge Pumps**

3.1 **Number of Fixed Bilge Pumps**

3.1.1 Monohull Craft

Each category B monohull craft is to be provided with three power bilge pumps connected to the bilge main. Each category A craft is to be provided with at least two power bilge pumps connected to the bilge main. One of the pumps in either case may be driven by the propulsion machinery.

3.1.2 Multihull Craft

On multihull craft, each hull is to be provided with at least two bilge pumps.

3.3 **Arrangement for Fixed Bilge Pumps**

The bilge system is to be arranged such that at least one power bilge pump will be available for use in all flooding conditions which the craft is required to withstand as follows:

- i) One of the bilge pumps is to be an emergency pump of a reliable submersible type connected to an emergency source of power; or
- ii) The bilge pumps and their sources of power are to be distributed throughout the length craft so that at least one pump in an undamaged compartment will be available.

3.5 **Submersible Bilge Pumps**

As an alternative to 5-1-4/3.1 and 5-1-4/3.3, an arrangement utilizing submersible pumps may be utilized. See 4-4-3/3.1.3.

5 **Manifold, Cocks and Valves**

Manifolds, cocks and valves in connection with the bilge pumping system are to be so arranged that, in the event of flooding, one of the bilge pumps may be operative in any compartment. In addition, damage to a pump or its pipe connection to the bilge main is not to make the bilge system inoperable. When, in addition to the main bilge pumping system, an emergency bilge pumping system is provided, it is to be independent of the main system and so arranged that a pump is capable of operating in any compartment under the specified flooding conditions. In that case, only the valves necessary for the operation of the emergency system need be capable of being operated from above the bulkhead deck.

All cocks and valves referred to above which can be operated from above the bulkhead deck are to have their controls at their place of operation clearly marked and are to be provided with means to indicate whether they are open or closed.

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CHAPTER **1** **Craft Intended to Carry Passengers**

SECTION **5** **Fire Protection**

1 **General**

The requirements in Part 4, Chapter 5 applicable for cargo craft of 500 gross tons and above are to be applied for all passenger craft, regardless of the gross tonnage. The following requirements also apply.

3 **Fire Sprinkler Systems**

Public spaces, service spaces, storage rooms other than those containing flammable liquids, and similar spaces are to be protected by a fixed sprinkler system. Manually operated sprinkler systems are to be divided into sections of appropriate size, and the valves for each section, the means to start the sprinkler pump(s) and alarms are to be operable from two spaces separated as widely as possible, one of which is to be a continuously manned control station. In category B craft, no section of the system is to serve more than one of the zones required in 5-1-5/7.1.2(a).

Plans of the system are to be displayed at each operating station.

Suitable alternatives may be accepted in lieu of a fixed sprinkler system provided the alternative is acceptable to the Administration

5 **Fireman's Outfits**

5.1 **Category A Craft**

The fireman's outfits in 4-5-2/15 are not required for Category A Craft.

5.3 **Category B Craft**

In addition to the two fireman's outfits required by 4-5-2/15, there are to be two more fireman's outfits for every 80 m (265 ft), or part thereof, of the aggregate of the lengths of all passenger spaces and service spaces on the deck which includes such spaces. If there is more than one such deck, the deck which has the largest aggregate of such lengths is to be used for determining the number of additional fireman's outfits to be carried. Each fireman's outfit is to consist of the items in 4-5-2/15. Also, one water fog applicator is to be provided for each pair of breathing apparatus. The water fog applicator is to be stored adjacent to the breathing apparatuses.

7 **Fire Safety Measures**

7.1 **General**

The requirements specified in 3-4-1/3 are applicable. In addition, the arrangement of spaces is to be as follows:

7.1.1 **Category A Craft**

For Category A craft, a single public space is acceptable.

7.1.2 **Category B Craft**

For Category B craft, public spaces are to be divided into zones according to the following:

7.1.2(a)

Passenger spaces are to be divided into at least two zones and the mean length of each zone is to be less than 40 m.

7.1.2(b)

For the occupants of each zone there should be an alternative safe area to which it is possible to escape in case of fire. The alternative safe area is to be separated from other passenger zones by smoke-tight divisions of non-combustible materials or fire-restricting materials extending from deck to deck. The alternative safe area can be another passenger zone provided the additional number of passengers may be accommodated in an emergency.

7.1.2(c)

The alternative safe area is to be located adjacent to the passenger zone it is intended to serve. There should be at least two exits from each passenger zone, located as far away from each other as possible, leading to the alternative safe area. Escape routes should be provided to enable all passengers and crew to be safely evacuated from the alternative safe area.

7.1.3

Control stations, stowage positions of life-saving appliances, escape routes and places of embarkation into survival craft are not to be located adjacent to any area of major or of moderate fire hazard.

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SECTION **6** **Electrical Installations**

1 **Emergency Source of Power**

The emergency source of electrical power is to comply with 4-6-2/5 except as modified below.

1.1 **Alternative to Emergency Source of Power**

Where the main source of electrical power is located in two or more compartments which are not contiguous, each of which has its own self-contained systems, including power distribution and control systems, completely independent of each other and such that a fire or other casualty in any one of the spaces will not affect the power distribution from the others, or to the services required by 1.3.1 or 1.3.2, the requirements of 4-6-2/5.1, 4-6-2/5.1.1 and 4-6-2/5.5.4 may be considered satisfied without an additional emergency source of electrical power, provided that:

- i)* There is at least one generating set, meeting the inclination requirements of 4-1-1/17 and of sufficient capacity to meet the requirements of 1.3.1 or 1.3.2 in each of at least two non-contiguous spaces;
- ii)* The arrangements required by 4-6-2/5.2 in each such space are equivalent to those required by 4-6-2/5.9, 4-6-2/5.9 and 4-6-2/5.15 so that a source of electrical power is available at all times to the services required by 1.3.1 or 1.3.2; and
- iii)* The generator sets referred to in 4-6-2/5.2(i) and their self-contained systems are installed such that one of them remains operable after damage or flooding in any one compartment

1.3 **Emergency Services**

1.3.1 **Category A Craft**

1.3.1(a) For a period of 5 hours, emergency lighting:

- i)* At the stowage positions of life-saving appliances;
- ii)* At all escape routes such as alleyways, stairways, exits from accommodation and service spaces, embarkation points, etc;
- iii)* In the public spaces;
- iv)* In the machinery spaces and main emergency generating spaces, including their control positions;
- v)* In control stations;
- vi)* At the stowage positions for fireman's outfits; and
- vii)* At the steering gear.

1.3.1(b) For a period of 5 hours

- i)* Main navigation lights, except for “not under command” lights;
- ii)* Electrical internal communication equipment for announcements for passengers and crew required during evacuation;
- iii)* Fire-detection and general alarm system and manual fire alarms; and
- iv)* Remote control devices of fire-extinguishing systems, if electrical.

1.3.1(c) For a period of 4 hours of intermittent operation:

- i)* The daylight signaling lamps, if they have no independent supply from their own accumulator battery; and
- ii)* The craft's whistle, if electrically driven; spaces, embarkation points, etc.

1.3.1(d) For a period of 5 hours:

- i)* Craft radio facilities and other loads as set out in 14.12.2 of the IMO's International Code of Safety for High-speed Craft; and
- ii)* Emergency control monitoring systems as required by 4-7-3/3.5.

1.3.1(e) For a period of 10 hours:

- i)* The "not under command" lights.

1.3.1(f) For a period of 10 minutes continuous operations:

- i)* Steering gear to comply with 4-6-2/11.5 if powered from the emergency

1.3.2 Category B Craft

The electrical power available is to be sufficient to supply all those services that are essential for safety in an emergency, due regard being paid to such services as may have to be operated simultaneously. The emergency source of electrical power is to be capable, having regard to starting currents and the transitory nature of certain loads, of supplying simultaneously at least the following services for the periods specified hereinafter, if they depend upon an electrical source for their operation:

1.3.2(a) For a period of 12 hours, emergency lighting:

- i)* At the stowage positions of life-saving appliances;
- ii)* At all escape routes such as alleyways, stairways, exits from accommodation and service spaces, embarkation points, etc;
- iii)* In the passenger compartments;
- iv)* In the machinery spaces and main emergency generating spaces, including their control positions;
- v)* In control stations;
- vi)* At the stowage positions for fireman's outfits; and
- vii)* At the steering gear.

1.3.2(b) For a period of 12 hours

- i)* The navigation lights and other lights required by the International Regulations for Preventing Collisions at Sea in force;
- ii)* Electrical internal communication equipment for announcements for passengers and crew required during evacuation;
- iii)* Fire-detection and general alarm system and manual fire alarms; and
- iv)* Remote control devices of fire-extinguishing systems, if electrical.

1.3.2(c) For a period of 4 hours of intermittent operation:

- i)* The daylight signaling lamps, if they have no independent supply from their own accumulator battery; and
- ii)* The craft's whistle, if electrically driven; spaces, embarkation points, etc.

1.3.2(d) For a period of 12 hours:

- i)* The navigational equipment as required by Chapter 13 of the IMO's International Code of Safety for High-speed Craft. Where such provision is unreasonable or impracticable, the Administration may waive this requirement for craft of less than 5,000 GT;

- ii) Essential electrically powered instruments and controls for propulsion machinery, if alternate sources of power are not available for such devices;
- iii) One of the fire pumps required by 4-4-1/3.3;
- iv) The sprinkler pump and drencher pump, if fitted;
- v) The emergency bilge pump and all the equipment essential for the operation of electrically powered remote controlled bilge valves as required by 5-1-4; and
- vi) Craft radio facilities and other loads as set out in 14.12.2 of the IMO's International Code of Safety for High-speed Craft.

1.3.2(e) For a period of 30 minutes:

- i) Any watertight doors, required by Part 3 Section 3, to be power-operated, together with their indicators and warning signals.

1.3.2(f) For a period of 10 min continuous operations:

- i) Steering gear to comply with 4-6-2/11.5 if powered from the emergency.

1.5 Transitional Source of Power

The transitional source of emergency electrical power required by 4-6-2/5.5.2(b)(ii) may consist of an accumulator battery suitably located for use in an emergency which is to operate without recharging while maintaining the voltage of the battery throughout the discharge period within 12% above or below its nominal voltage and be of sufficient capacity and so arranged as to supply automatically in the event of failure of either the main or emergency source of electrical power at least the following services, if they depend upon an electrical source for their operation:

1.5.1

For a period of 30 min, the load specified in 5-1-6/1.3.1(a) through 5-1-6/1.3.1(c) or in 5-1-6/1.3.2(a) through 5-1-6/1.3.2(c); and

1.5.2

With respect to the watertight doors:

- i) Power to operate the watertight doors, but not necessarily simultaneously, unless an independent temporary source of stored energy is provided. The power source should have sufficient capacity to operate each door at least three times (i.e., closed – open – closed) against an adverse list of 15°; and
- ii) Power to the control, indication and alarm circuits for the watertight doors for half an hour.

The above requirements may be considered satisfied without the installation of a transitional source of emergency electrical power if each of the services required by that paragraph has independent supplies, for the period specified, from accumulator batteries suitably located for use in an emergency. The supply of emergency power to the instruments and controls of the propulsion and direction systems should be uninterrupted.

1.7 Supplemental Emergency Light for Craft Having Special-Category Spaces

In addition to the emergency lighting required by 1.3.1(a), 1.3.2(a) and 1.5.1 on every craft with special-category spaces:

1.7.1

All passenger public spaces* and alleyways are to be provided with supplementary electric lighting that can operate for at least 3 h when all other sources of electric power have failed and under any condition of heel. The illumination provided is to be such that the approach to the means of escape can be readily seen. The source of power for the supplementary lighting is to

consist of accumulator batteries located within the lighting units that are continuously charged, where practicable, from the emergency switchboard. Alternatively, any other means of lighting, which is at least as effective, may be accepted by the Administration.

The supplementary lighting is to be such that any failure of the lamp will be immediately apparent. Any accumulator battery provided is to be replaced at intervals having regard to the specified service life in the ambient condition that it is subject to in service; and

1.7.2

A portable rechargeable battery-operated lamp is to be provided in every crew space alleyway, recreational space and every working space which is normally occupied unless supplementary emergency lighting, as required by 1.7.1, is provided.

- * In category A craft having limited public spaces, emergency lighting fittings of the type described in 1.7.1 as meeting the requirements of 1.3.1(a) and 1.5.1 may be accepted, provided that an adequate standard of safety is attained.

1.9 Arrangement for Periodic Testing

Provision is to be made for the periodic testing of the complete emergency system, including the emergency consumers required by 1.3.1 or 1.3.2 and 1.5, and is to include the testing of automatic starting arrangements.

1.11 Distribution

Distribution systems are to be so arranged that fire in any main vertical zone will not interfere with services essential for safety in any other such zone. This requirement will be met if main and emergency feeders passing through any such zone are separated both vertically and horizontally as widely as is practicable.

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CHAPTER **1** **Craft Intended to Carry Passengers**

SECTION **7** **Ro-Ro Craft**

1 **General**

Craft which are intended for carrying motor vehicles in addition to passengers are to comply with the following requirements.

3 **Definition of Spaces**

3.1 **Open Vehicle Spaces**

Open vehicle spaces are spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion, to which passengers have access, that are either open at both ends or open at one end and provided with adequate natural ventilation effective over their entire length through permanent openings in the side

3.3 **Special Category Spaces**

Special category spaces are those enclosed spaces intended for the carriage of motor vehicles with fuel in their tanks for their own propulsion, into and from which such vehicles can be driven, and to which passengers have access, including spaces intended for the carriage of cargo vehicles.

5 **Electrical Equipment and Ventilation**

Electrical equipment and ventilation for special category spaces are to be in accordance with 4-6-6/1.

7 **Fire Detection and Fire Alarm System**

Open vehicle spaces and special category spaces are to be provided with fire detection and fire alarms system complying with 4-5-1/13.

9 **Fire Extinguishing System**

Each special category space is to be fitted with an approved manually-operated fixed pressure water spraying system. Other types of fire extinguishing systems may be considered provided that they have been shown by full-scale test in conditions simulating a flowing petrol fire in a special category space to be not less effective in controlling fires likely to occur in such a space.

11 **Fire Extinguishing Equipment**

Each special category space is to be provided with the following fire extinguishing equipment.

- i)* At least three water fog applicators.
- ii)* One portable foam applicator unit consisting of an air-foam nozzle of an inductor type capable of being connected to the fire main by a fire hose, together with a portable tank containing 20 liters (5 U.S. gallons) of foam-making liquid and one spare tank. The nozzle is to be capable of producing effective foam suitable for extinguishing an oil fire at the rate of at least 1.5 m³/min. (53 ft³/min.). Each craft having special category spaces is to be provided with at least two portable foam applicator units as a minimum.

- iii)* Portable fire extinguishers located so that no point in the space is more than 15 m (50 ft) from an extinguisher, provided that at least one portable extinguisher is located at each access to the space.

13 Scuppers, Bilge Pumping and Drainage

In order to prevent a serious loss of stability which could result due to large quantities of water accumulating on the vehicle deck(s) from operation of the fixed water spraying system in 5-1-7/11, scuppers are to be fitted to directly discharge the water overboard. Alternatively, pumping and drainage arrangements may be provided additional to the requirements in 5-1-4.

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CHAPTER **1** **Craft Intended to Carry Passengers**

APPENDIX **1** **Guidelines for Accommodation Design of Passenger Craft**

Note:

This Appendix is prepared to give guidelines to users of these Rules to design, build and operate craft intended to carry passengers on International voyages. It should be noted that any interpretations to the International Code of Safety for High-Speed Craft in this respect issued by the flag Administration govern the guidelines in this Appendix.

1 **General**

For passenger craft, superimposed vertical accelerations above 1.0g at the longitudinal center of gravity should be avoided unless special precautions are taken with respect to passenger safety.

3 **Design Acceleration Levels**

Passenger craft are to be designed for the collision load with respect to the safety in, and escape from, the public spaces, crew accommodation and escape routes, including in way of life-saving appliances, and emergency source of power. The size and type of craft together with speed, displacement and building material are to be taken into consideration when the collision load is determined. The collision design condition is to be based on a head on collision at operational speed with a vertical rock with maximum 2 m height above the waterline. Unless any specific data of collision energy are available in the process of design, the following may be used for assessment of collision deceleration. Where the deceleration of the craft is determined by carrying out a collision load analysis of the craft in accordance with these assumptions, that value may be used as g_{coll} .

3.1 **Monohulls**

$$g_{coll} = \frac{1.2kP}{\Delta}$$

where

g_{coll} = collision deceleration, in g's

k = 0.102 (1.0, 1.0)

P = $k_1 \sqrt[3]{EC_H(MC_L)^2}$ kN (tf, Ltf)

but not less than $k_2 MC_L \sqrt{C_H(k_3 d_c + 2)}$ kN (tf, Ltf)

k_1 = 460 (100, 66.9)

k_2 = 9000 (918, 903)

k_3 = 1 (1, 0.305)

M = 0.95 for mild steel

= 1.3 for higher tensile steel

- = 1.0 for aluminum alloy
 = 0.8 for fiber reinforced plastic
- $$C_L = \frac{(165 + k_3 L_C)}{245} + \left(\frac{k_3 L_C}{80}\right)^{0.4}$$
- $$C_H = \frac{k_3 d_c + 2 + f(k_3 D_C/2)}{2k_3 D_C}$$
- L_C = overall length of the underwater watertight envelope of the rigid hull, excluding appendages, at or below the design waterline in the displacement mode with no lift or propulsion machinery active.
- D_C = depth of the craft measured at the middle of L from the underside of the keel to the top of the effective hull girder, in meters (feet)
- d_c = buoyancy tank clearance to skirt tip (m, (ft), (negative)) for air-cushion vehicles; lifted clearance from keel to water surface (m, (ft) (negative)) for hydrofoils; and draft of the craft measured at the middle of L from the underside of the keel to the design load waterline, in m (ft), for all other craft.
- f = 0 when $(d_c + 2) < D_C$ SI or MKS units, [$(d_c + 6.6) < D_C$ U.S. units]
 = 1 when $(d_c + 2) < D_C$ SI or MKS units, [$(d_c + 6.6) < D_C$ U.S. units]
- E = kinetic energy of the craft
 = $0.132\Delta V^2$ kN-m ($0.0135\Delta V^2$ tf-m, $0.0442\Delta V^2$ Ltf-ft)
- Δ = average craft displacement taken as the mean of the lightweight and the maximum operational displacement, in tonnes (long tons)
- V = operational speed of the craft, in knots
- g = 9.81 (1.0, 32.2)

3.3 Catamarans and SES Craft

Catamarans and SES craft may use the same equation as given in 5-1-A1/3.1 for g_{coll} with the following exceptions:

- f = 0 when $T + 2 < D_C - H_T$ SI or MKS units [$T + 6.6 < D_C - H_T$ U.S. units]
 = 1 when $D_C > (T + 2) \geq D_C - H_T$ SI or MKS units, [$D_C > (T + 6.6) \geq D_C - H_T$ U.S. units]
 = 2 when $T + 2 \geq D_C$ SI or MKS units, [$T + 6.6 \geq D_C$ U.S. units]
- T = lifted clearance from the keel to the water surface, in m (ft), taken as negative
- H_T = minimum height from tunnel or wet deck bottom to the top of the effective hull girder, in meters (feet)

3.5 Air Cushion Vehicles

Air cushion vehicles may use the same equation as given in 5-1-A1/3.1 for g_{coll} with the following exceptions:

- f = 1 when $H_T > 2$ SI or MKS units, ($H_T > 6.6$ US units)
 = 2 when $H_T \leq 2$ SI or MKS units, ($H_T \leq 6.6$ US units)

H_T is as defined in 5-1-A1/3.3.

3.7 Hydrofoils

Hydrofoils may use the same equation as given in 5-1-A1/3.1 for g_{coll} . However, g_{coll} is not to be taken less than (kF/Δ) where:

F = failure load of bow foil assembly applied at the operational waterline, in kN (tf, Ltf)

k and Δ are as defined in 5-1-A1/3.1.

5 Accommodation Design

5.1 Location of Public Spaces

Public spaces are not to be located within a distance of $0.0132V^2/g_{coll}$ meters ($0.0434V^2/g_{coll}$ feet) of the extreme forward end of the top of the effective hull girder of the craft, where the terms V and g_{coll} are as defined in 5-1-A1/3.1. For the purpose of this requirement, g_{coll} is not to be taken as greater than 12, and need not be taken as less

5.3 Accommodation Requirements

Accommodations are to be as required by 5-1-A1/5.5 TABLE 1, and are to be designed to a recognized standard.

5.5 Foundations

Calculations are to be submitted indicating that foundations for large masses such as main engines, auxiliary engines, lift fans, transmissions and electrical equipment can withstand the collision design acceleration, g_{coll} , as given in 5-1-A1/3.1, without fracturing.

**TABLE 1
Accommodation Requirements**

		g_{coll}		
		< 3	$3 \leq g_{coll} \leq 12$	> 12
Seat	Seatback Requirements	Low or high seatback	High seatback with protective deformation and padding	High seatback with protective deformation and padding
	Seating Direction	No restrictions	Forward or backward	Forward or backward
	Sofas	Sofas allowed	Not allowed as seats	Not allowed
	Seat Belts	Not required	Lap belt required in seats with no protective structure forward	Three point belt or belt with shoulder harness in forward facing seats
Tables		No restrictions	Protective features and dynamic testing required	Not allowed
Projecting objects		Padding required	Padding required	Padding required and is to be specially approved.
Kiosks, bars, etc.		No restrictions	Only on aft side of bulkheads or specially approved	Specially approved

	g_{coll}		
	< 3	$3 \leq g_{coll} \leq 12$	> 12
Baggage	No restrictions	Protection required forward	Protection required forward and is to be specially approved
Large masses	To be restrained and positioned	To be restrained and positioned	To be restrained and positioned and to be specially approved

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CHAPTER **2 Crewboat**

SECTION **1 General**

*This Notation has been developed for the Class Notation, **CREWBOAT**, which will be eligible for the craft specifically fitted with equipment for the transferring/transporting of industrial personnel in the offshore oil and gas industry between a shore base facility and the offshore oil and offshore gas installations and vice versa, however Crewboats are not considered as a Passenger Craft. Furthermore, the provisions of this section is applicable to craft's whose Gross Tonnage does not exceed 500 Gross Tons (ITC). Crewboats may also carry cargo as part of its normal operations. During development, some specific requirements normally applied for High-Speed Craft are specially considered and replaced with the new customized requirements in view of the unique configurations and the typical service routines of crewboats. As a result, the hull scantlings could be optimized based on the anticipated en route weather conditions. Further, provided the craft has multiple propulsion units and has the capability of returning to the port of refuge under all conditions after a single failure, the duplication of machinery equipment currently required for a single propulsion unit can be reduced without changing the current level of safety.*

1 Application (2016)

These requirements are intended to apply to a craft which meets the requirements of 5-2-1/3. Crewboats are to comply with the *High-Speed Craft Rules* in its entirety, except as modified herein. Crewboats that are intended solely for service in restricted voyages are to comply with the requirements of this Section, and ABS may also consider the Flag Administration's Ship Safety Regulations as an alternative in satisfying specific areas of the *High-Speed Craft Rules* and this Chapter.

3 Classification

3.1 General (2016)

In accordance with 1-2-2/1, the classification ~~⊗~~ **A1, HSCCrewboat** is to be assigned to a craft specifically fitted for the transferring/transporting of industrial personnel (minimum capacity for 12 industrial personnel required for classification. See 5-2-1/9.7, 5-2-1/9.9 and 5-2-3/7) in the offshore oil and gas industry between a shore base and offshore installations and vice versa. These craft may also carry cargo, but are not considered as a Passenger Craft.

For craft which is intended to operate in various sea-states exceeding the design significant wave heights defined in 3-2-2/1.1.3 TABLE 1, the **OE** notation may be assigned and be entered into the *Record*.

3.3 Crewboat Operational Limits

3.3.1 General

The Crewboat's Operational Limits, as defined by 5-2-1/3.3.2, 5-2-1/3.3.3 and 5-2-1/3.3.4, are to be included in the craft's Operating Manual. See 3-2-1/9 and 5-2-1/3.5.

3.3.2 Restricted Voyages (2016)

When carrying more than 12 industrial personnel, the craft is to be limited to restricted voyages, traveling in the course of its voyage no more than 200 nautical miles from a Place or Refuge. See 5-2-1/9.13

3.3.3 Transit Voyages (2016)

Transit voyages include delivery voyages (i.e., builder's port to base port), and voyages for repositioning purposes (i.e., change of base port and/or route).

The craft's maximum range, in nautical miles, from a Place of Refuge is to be such that, in the normal course of the voyage, there is a minimum reserved fuel capacity equal to 25% of the craft's aggregate fuel oil capacity. Calculations to verify the maximum range from a place of refuge are to be submitted for review.

When the craft is engaged on an international transit voyage, the craft may carry a maximum of 12 industrial personnel provided the craft is fitted with accommodation spaces for 100% of the industrial personnel in addition to those provided for the crew.

3.3.4 Special Consideration

In addition to 5-2-1/3.3.2 and 5-2-1/3.3.3, any specific operational limits required by the Flag Administration and/or Port State are to be specially considered, and be documented in the craft's Operating Manual.

3.5 Operations Manual

In addition to 3-2-1/9, the Crewboat's Operational Limit (i.e., maximum range from a place of refuge) per 5-2-1/3.3 shall be specifically defined in the craft's Operating Manual.

The craft shall be operated in accordance with the ABS Approved Operating Manual, and reference to the Operating Manual will be distinguished in the *Record* by a Special Comment as well as placed on the face of the Load Line Certificate for the guidance of the Master

5 Scope

This Chapter is intended to cover the hull construction and machinery requirements to class a craft as a Crewboat

7 Administration Approval

In general, the approval of material for use in accommodation, safety equipment, life-saving appliances, etc., is a function of the Administration.

When given specific instructions from the Administration, ABS may approve and accept material, equipment, life-saving appliances, etc. fitted on the craft. See 5-2-8 for specific requirements for the lifesaving arrangements.

9 Definitions

9.1 General

For definitions of terms used in this Section and not shown below, reference is to be made to the definitions in various Chapters of the International Code of Safety for High-Speed Craft (IMO HSC Code).

9.3 Administration

Administration means the Government of the State whose flag the craft is entitled to fly.

9.5 Gross Tonnage

The measurement of the internal volume of spaces within the craft as defined by the International Convention on Tonnage Measurement of Ships, 1969 (ITC).

9.7 Industrial Personnel

Industrial personnel means every person carried onboard a Crewboat for the sole purpose of carrying out the business or functions of the offshore installations. Examples of industrial personnel include tradesmen, such as mechanics, plumbers, electricians, and welders; laborers, such as wreckers and construction workers; and other persons such as supervisors, engineers, technicians, drilling personnel, and divers.

9.9 Public Space

Public spaces are those spaces allocated for the industrial personnel and include seating areas, lavatories, and similar permanently enclosed spaces allocated for the workers.

9.11 Failure Modes and Effect Analysis

A Failure Modes and Effect Analysis (FMEA) is an examination of the craft's systems and equipment to determine whether any reasonably probable failure or improper operation can result in a hazardous or catastrophic effect. Also see Appendix 4 of the IMO HSC Code for guidance. Other risk assessment methods will be specially considered in place of an FMEA.

9.13 Place of Refuge

Any naturally or artificially sheltered area which may be used as a shelter by a craft under conditions likely to endanger is safety.

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CHAPTER **2 Crewboat**

SECTION **2 Stability**

1 Stability

The stability of the craft is to be in accordance with the requirements of Part 3, Chapter 3. Where subdivision and damage stability requirements are not defined by the Flag Administration's Ship Safety Regulations, the craft is to comply with one of the following:

- i)* A published standard from an organization recognized by ABS as being acceptable.
- ii)* The IMO High-Speed Craft Code – Chapter 2, regardless of tonnage.

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CHAPTER **2 Crewboat**

SECTION **3 Construction**

1 General

The scantling and arrangements are to be in accordance with the applicable requirements of Part 3 with the modifications listed below:

3 Rudders

The requirements of 3-2-8 are to be complied with. However, in 3-2-8/1.3, a value of Y greater than 450 N/mm² (46 kgf/mm², 65000 psi) may be considered for austenitic or age-hardened martensitic stainless steels.

5 Operational Parameters

The design pressures for the craft are to be developed using the equations in 3-2-8 with the following modifications:

$h_{1/3}$ = 3.35 m (11 ft) minimum significant wave height.

V = maximum design speed in knots corresponding to an $h_{1/3}$ defined above.

For $h_{1/3}$ greater than defined above, the maximum speed is to be reduced to maintain a constant n_{xx} . See 3-2-2/1.1.3. This will produce a relationship between the craft speed, V , and the significant wave height, $h_{1/3}$ that is to be reported in the craft operational manual, see 3-2-1/9. For $h_{1/3}$ less than defined above, the craft will be eligible for a limited service classification Notation, see 1-2-2/7.3.

7 Provisions for Industrial Personnel

Industrial personnel accommodation spaces are to be designed so that the occupants are protected from unfavorable environmental conditions. These spaces are to be provided with heat, air conditioning, light and ventilation. Furthermore, at least one sanitary facility is to be provided and include a washbasin and a toilet.

Each industrial person carried onboard shall be provided with a seat.

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CHAPTER **2 Crewboat**

SECTION **4 Anchoring**

1 General

All crewboats are to have anchor and chain that comply with the requirements in Part 3, Chapter 5 or the requirements listed below. The symbol **Ⓔ**, a condition of classification, indicates that the equipment of the craft is in compliance with the requirements in this Section and tested in accordance with 3-5-1/7. The following is an example: **ⓂA1Ⓔ, HSCCrewboat, OE, ⓂAMS**.

3 Anchor Size Requirements

A minimum of one (1) anchor is to be provided that has a holding power in a bottom that has an average consistency between mud and sand that is greater than determined by the following equation. The holding power of the anchor is to be certified by the anchor manufacturer.

$$HP = 0.0195AV_w^2 + 0.114\sqrt{\Delta L}(V_c)^{1.825} + 7.74N_pA_pV_c^2 \text{ kg}$$

$$HP = 0.004AV_w^2 + 0.14\sqrt{\Delta L}(V_c)^{1.825} + 1.59N_pA_pV_c^2 \text{ lbf}$$

where

- HP = required holding power of anchor, in kg (lbf)
- A = projected frontal area of the craft above the waterline, in m^2 (ft^2)
- V_w = velocity of wind acting on the craft, not to be taken less than 50 knots
- Δ = molded displacement of the craft, in mt (Ltf), to the summer load waterline
- L = length of craft, in m (ft), as defined in 3-1-1/3
- V_c = velocity of current acting on the craft, not to be taken less than 3 knots
- N_p = number of propellers fitted on the craft
- A_p = area of one propeller, in m^2 (ft^2)

As an alternative to the above, an equipment number can be developed in accordance with the requirements of 3-5-1/3 and can be fitted with one anchor of one-half the tabular weight listed in 3-5-1/19.7 TABLE 1A

5 Anchor Chain and Wire Rope

The equipment number for the craft is to be determined using the equations in 3-5-1/3. The required chain diameter is to be as indicated in 3-5-1/19.7 TABLE 1A and the required chain length is to be one-half the length as indicated in 3-5-1/19.7 TABLE 1A.

If wire rope is to be used in lieu of chain, the wire is to have a breaking strength not less than the grade 1 chain of required size and a length of at least 1.5 times the chain it is replacing. Between the wire rope and

anchor, chain cable of the required size and having a length of 12.5 m (41.0 ft), or the distance between the anchor in the stored position and winch, whichever is less, is to be fitted.

7 Synthetic Fiber Rope

Synthetic fiber rope may be used in lieu of anchor chain cable provided the craft meets the following:

- i) A length of chain is to be fitted between the anchor and synthetic fiber line.
- ii) The chain is not to be less than the required grade 1 chain for the equipment number.
- iii) The chain length is to be at least the distance between the windless and the anchor in the stowed position and not less than $0.2L$ meters (feet).
- iv) The ropes are to be stowed on drums, protected from the weather and sea, and are to be lead over rollers.
- v) The rope length is to be at least 1.5 times the required chain cable length.
- vi) The breaking strength of the rope is to be at least equal to the breaking strength of the required grade 1 chain cable.
- vii) Synthetic fiber ropes for this application are to be polyamide fiber rope or equivalent. Polypropylene rope is not to be used.
- viii) If the anchors are HHP or SHHP, the combined cable/synthetic rope is to be adequate for the verified holding power of the anchor.

9 Anchor Winch or Windlass

An anchor windlass or winch is to be provided as per the following:

- i) For an anchor weight less than 85 pounds, no winch or windlass is required.
- ii) For an anchor weight greater than 85 pounds an anchor winch or windlass is to be fitted that is provided with certificate from the manufacturer stating that the equipment has been designed to accommodate the breaking strength of the required chain or wire rope.

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CHAPTER **2 Crewboat**

SECTION **5 Machinery and Piping Installations**

1 General

Machinery installations are to be in accordance with the applicable requirements of Part 4 for cargo craft unless modified herein. Cargo and piping systems not covered by these Rules are to comply with the applicable requirements of the *ABS Rules for Building and Classing Steel Vessels Under 90 Meters (295 Feet) in Length*.

3 Failure Mode Effects Analysis

An FMEA is to be submitted for craft with propulsion and/or steering arrangements such that failure/loss of any one component would drastically affect the craft's ability to maneuver and/or maintain a heading. The FMEA is to demonstrate that the craft is capable of returning to a port of refuge under all conditions with any single failure in the steering or propulsion system.

5 Fuel Oil System

5.1 Fuel Oil Booster Pumps

Spare fuel oil booster pumps required by 4-2-1/3.3 need not be carried provided the craft is fitted with more than two propulsion engines arranged such that the craft can safely return to a port of refuge under all conditions (See 3).

5.3 Fuel Oil Transfer Pumps

Two fuel oil transfer pumps required in 4-4-4/3.1 need not be provided if the engines are capable of drawing fuel directly from all fuel tanks.

7 Lube Oil System

Spare lube oil pumps required by 4-2-1/9.7 need not be carried provided the craft is fitted with more than two propulsion engines arranged such that the craft can safely return to a port of refuge under all conditions (See 3). Furthermore, where a dedicated reduction gear is provided for each propulsion engine and more than two engines are fitted, a spare lube oil pump for the reduction gear will not be required.

9 Cooling Water

9.1 Cooling Water Sea Suctions

Two independent sea suction required by 4-2-1/11.3 need not be provided if the craft has more than two propulsion engines and dedicated seawater cooling suction for each engine.

9.3 Strainers

Duplex seawater strainers required by 4-2-1/11.5 need not be provided if the craft meets the requirements.

9.5 Cooling Water Pumps

Spare cooling water pumps required by 4-2-1/11.7 need not be carried provided the craft is fitted with more than two propulsion engines arranged such that the craft can safely return to a port of refuge under all conditions (See 3). Furthermore, where a dedicated reduction gear is provided for each propulsion engine and more than two engines are fitted, two means of supplying cooling water to the reduction gear will not be required.

11 Flexible Hoses

In addition to the requirements of 4-4-1/9.19, flexible hoses secured with hose clamps may not be installed in fill, sounding, and venting pipes of oil systems, vital systems, or other systems containing hazardous fluids.

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CHAPTER **2 Crewboat**

SECTION **6 Fire Protection**

1 Fire Detection System

A fire detection system complying with Subsections 7.7.1 and 7.7.2 of the IMO HSC Code is to be installed throughout machinery, accommodation, and service spaces, regardless of the electric generating plant size.

3 Fire Extinguishing Systems

3.1 General

Category A Machinery Spaces are to be protected by a fixed fire extinguishing system complying with 4-5-2/11, 4-5-3/3 or 4-5-4/7, as applicable.

3.3 Controls

Further to 4-5-2/11.1.4, controls for the fixed fire extinguishing systems are to be readily accessible and so located such that they may be operated from a location which can be easily reached under all weather and loading conditions.

3.5 Portable Fire Extinguishers

Two portable fire extinguishers required for machinery spaces by 4-5-1/17 TABLE 2 are to be located outside the machinery space, but in the vicinity of the main entrance to the machinery space (typically within 1 meter of the entrance). The remaining required extinguishers are to be distributed throughout the machinery space.

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CHAPTER **2 Crewboat**

SECTION **7 Electrical Installations**

1 Shaft Tachometers

In lieu of Item 1 “Propeller Speed Display” of 4-7-5/17 TABLE 8, engine RPM and clutch indicators may be substituted for a shaft tachometer.

3 Interior Communications

Section 4-6-2/15 is applicable to all Crewboats, regardless of electric generating plant size.

5 Navigation Lights

Section 4-6-2/13 is applicable to all Crewboats, regardless of electric generating plant size.

Navigation lights are to be in accordance with applicable sections of 1972 COLREGS

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CHAPTER **2 Crewboat**

SECTION **8 Life Saving Appliances**

1 General

Where the Flag Administration has no specific requirements, craft are to comply with either:

- i)* Chapter 8 of the IMO HSC Code for cargo craft, regardless of tonnage, except that a rescue boat and children's lifesaving appliances are not required, or
- ii)* A published standard from an organization recognized by ABS as being acceptable provided they are no less effective than the IMO HSC Code.

3 Emergency Position Indicating Radio Beacon (EPIRB)

One satellite EPIRB shall be provided for those craft not limited to restricted voyages (See 5-2-1/3.3.2).