財團法人驗船中心
CR CLASSIFICATION SOCIETY

RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF COAST GUARD SHIPS 2025

AMENDMENT

June 2025

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The following Parts have been amended and the effective dates are:	
Part	**Effective date**
I	1 January, 2026
II	1 January, 2026
III	1 January, 2026
IV	1 January, 2026

The Rules for the Construction and Classification of Coast Guard Ships 2025 and this Amendment are to be consolidated and published as *January 2026 Edition*.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF COAST GUARD SHIPS 2025"

PART I CLASSIFICATION AND SURVEY

List of major changes in Part I from 2025 edition

1.6.4(f)(ii)	Revised
1.15.1(j) & (k)	Revised
1.17.2(c)	Revised
Table I 1-4	Revised
Table I 1-6	Revised
2.2.1(d)	Revised
2.3.4	Revised
2.5.1	Revised
2.7.1(c)	Revised
2.9	Revised

Rules for the Construction and Classification of Coast Guard Ships 2025 have been partly amended as follows:

Chapter 1
Classification of Steel Ship

Paragraph 1.6.4(f)(ii) has been amended as follows:

1.6 Surveys of Ships

1.6.4 Special Survey

(f) Continuous survey

(i) At the request of the owner, and upon approval of the proposed arrangement, a system of continuous surveys ~~for hull, machinery and cargo refrigerating machinery appliances,~~ may be undertaken~~, except for hull surveys of tankers, bulk carriers and similar types of ships,~~ where-by the Special Survey requirements are carried out in regular cycle to complete all the requirements of the particular Special Survey within a 5-year period. ~~If the continuous survey is completed beyond the 5-year period, the completion date is to be recorded to agree with the original due date of the cycle. If the continuous survey is completed prematurely but within 3 months prior to the due date, the Special Survey is to be credited to agree with the effective due date. The continuous survey can, also be adopted respectively for the hull, the machinery including the electrical equipment and the refrigerated cargo installations.~~

(ii) ~~Where some items of the machinery are opened up and examined by the recognized chief engineer as normal routine for maintenance at ports where the Surveyor is not available or at sea, the open-up inspection of the items, at the request of Owner, under certain conditions, may be dispensed with at the discretion of the Surveyor subject to a confirmatory survey at the convenient port of call where the Surveyor is available. The confirmatory survey is to be carried out within 5 months from the date of the item of the machinery which was opened up and inspected by the recognized chief engineer. If deemed necessary by the Surveyor, the individual item may be inspected again.~~
Machinery continuous survey (MCS) is to comply with the requirements in "Guidelines for Machinery Special Survey Carried Out on Continuous Survey Basis" and the following:

(1) During the MCS, when any defect or damage is found, similar machinery and equipment, or a part of them, may be required to be opened up for further examination as deemed necessary by the Surveyor, and all the defective items or failures found are to be repaired to the Surveyor's satisfaction.

(2) Survey items deemed appropriate by the Society may be delegated to overhaul inspections by the Owner (or the ship management company). In this case, the records of the overhaul inspections of the machinery and equipment concerned are to be ascertained as soon as possible. When it is regarded that satisfactory maintenance has not been carried out, an open-up inspection in the presence of the Surveyor may be required.

(iii) All items stipulated in 2.7.1 except thickness measurement are covered by a system of continuous survey for hull. The thickness measurement for the ship which adopts a system of continuous survey for hull conducted before the 4th annual survey cannot be credited for the Special Survey.

Paragraph 1.15.1(j) & (k) have been amended as follows:

1.15 Sea Trials

1.15.1 In the classification survey of all ships, sea trials specified in following (a) to (j) are to be carried out in full load condition, in the calmest possible sea and weather condition and at the deep unrestricted water. However, where sea trials cannot be carried out in full load condition, sea trials may be carried out in an appropriate loaded condition. The noise measurements specified in (k) are to be carried out at either the full load condition or the ballast condition.

(a) Speed test.

(b) Astern test.

…

(i) Measurement of the torsional vibration for the shafting systems. (refer to Part IV Chapter 6 of the Rules for Steel Ships)

Where it is to be deemed as appropriate by the Society, the measurement of the torsional vibration for the shafting systems during the sea trials may be dispensed with, provided that sufficient analysis data (eg. torsional vibration analysis), that ensure there is no critical vibration within the service speed range.

(j) Measurement of the sound pressure levels of the fire alarm system (refer to 2.5 of Chapter 9 of the FSS Code), the general emergency alarm system~~, fire alarm (if not incorporated in the general emergency alarm system)~~ and the public address system (refer to 7.2 of the LSA Code). ~~(if used for sounding the general emergency alarm and/or the fire alarm)~~.

(k) Noise measurements. (~~If applicable,~~ refer to Chapter 34 of Part II, as applicable)

(l) Other tests where deemed necessary by the Society.

Some sea trial tests of an individual ship may be dispensed with provided that the available data can be obtained from those of a sister ship or other adequate means and a special approval in given by the Society.

Paragraph 1.17.2(c) has been amended as follows:

1.17 Liability and Compensation

1.17.2 Article 2

(a) Classification is the appraisement given by the Society for its Client, at a certain date, following surveys by its surveyors along the lines specified in 1.17.3 and 1.17.4 hereafter on the level of compliance of a Unit to its Rules or part of them. This appraisement is represented by a class entered on the Certificates and periodically transcribed in the Society's Register.

(b) Certification is carried out by the Society along the same lines as set out in 1.17.3 and 1.17.4 hereafter and with reference to the applicable National and International Regulations or Standards.

(c) It is incumbent upon the Client to maintain the condition of the Unit after surveys, to present the Unit for surveys and to inform the Society without delay of circumstances which may affect the given appraisement or cause to modify its scope. The Client is to be responsible for the operation, maintenance, and management of the Unit, including machinery maintenance and upkeep, compliance with regulatory requirements, and ensuring the safety and seaworthiness, etc..

(d) The Client is to give to the Society all access and information necessary for the performance of the requested services.

Table I 1-4 has been amended as follows:

Table I 1-4
List of Additional Survey Notation

Notation	Description	Reference
IWS	This notation (**I**n **W**ater **S**urvey) will be assigned to ship which are suitable for In-Water Survey in lieu of bottom survey in dry dock.	Part I/1.6.7(b) & 2.2.2 of the Rules
PCM-OLW(1)	This notation (**P**ropeller shaft **C**ondition **M**onitoring– **O**pen **L**oop **W**ater-lubricated) will be assigned when open loop water-~~oil~~ lubricated propeller shaft arrangements ~~with approved oil glands~~ are fitted and the requirements of 2.3.4 of Part I of the Rules are complied with.	Part I/2.3.4 of the Rules
PMS(1)	This notation (**P**lanned **M**aintenance **S**cheme for machinery) will be assigned to ships for which an approved planned maintenance scheme for machinery is adopted as an alternative to continuous survey for machinery.	Part I/1.6.4(g) of the Rules

Note:
(1) Means notation, when assigned, to be added after the classification symbol **CMS**.

Table I 1-6 has been amended as follows:

Table I 1-6
List of Navigation Safety Notation

Notation	Description	Reference
~~**NAV**(1)~~	~~This notation will be assigned to ships when the requirements of navigation safety system in Chapters 2 and 3 of Part XIII of the Rules are complied with.~~	~~Part XIII Chapters 2 and 3~~
~~**NAV0**(1)~~	~~This notation will be assigned to ships when the requirements of navigation safety system in Chapters 2, 3, 4, 5, 6, 7, 9 and 10 of Part XIII of the Rules are complied with.~~	~~Part XIII Chapters 2, 3, 4, 5, 6, 7, 9 and 10~~
~~**NAV1**(1)~~	~~This notation will be assigned to ships when the requirements of navigation safety system in Chapters 2 to 10 of Part XIII of the Rules are complied with.~~	~~Part XIII Chapters 2 to 10~~
NSL(1)	This notation will be assigned to ships when the requirements of Navigation Safety System in Chapter 1 and Chapter 2 of Part XIII of the Rules for Steel Ships are complied with, and which have been constructed and installed under the survey of the Society.	Part XIII Chapters 1 and 2 of the Rules for Steel Ships
NSLES(1)	This notation will be assigned to ships when the requirements of Navigation Safety System in Chapters 1 to 3 of Part XIII of the Rules for Steel Ships are complied with, and which have been constructed and installed under the survey of the Society.	Part XIII Chapters 1 to 3 of the Rules for Steel Ships
NSLESD(1)	This notation will be assigned to ships which have fulfilled the requirements of the notation NLES and which are also equipped with additional equipment specified in Chapter 3 of Part XIII of the Rules for Steel Ships on the bridge wings as well as constructed and installed under the survey of the Society.	Part XIII Chapters 1 to 3 of the Rules for Steel Ships
NSLES(COS) (1)	This notation will be assigned to ships when the requirements of Navigation Safety System in Chapters 1 to 4 of Part XIII of the Rules for Steel Ships are complied with, and which have been constructed and installed under the survey of the Society.	Part XIII Chapters 1 to 4 of the Rules for Steel Ships
NIBS(1)	This notation will be assigned to ships equipped with an Integrated Bridge System (IBS) in compliance with IMO document SN.1/Circ.288 and found to be in compliance with Chapter 1 and Chapter 5 of Part XIII of the Rules for Steel Ships, and which have been constructed and installed under the survey of the Society.	Part XIII Chapters 1 and 5 of the Rules for Steel Ships

Note:

(1) Means notation, when assigned, to be added after the classification symbol **CMS**.

Chapter 2
Survey Requirements of Coast Guard Ships

Paragraph 2.2.1(d) has been amended as follows:

2.2 Bottom Surveys

2.2.1 Bottom Surveys in dry dock

At each Bottom Survey in dry dock the following requirements are to be complied with:

(a) Normally the ship is to be placed on blocks of sufficient height in a dry dock or on a slipway and cleaned, and proper staging is to be erected as may be necessary for examination. A docking survey covers an examination of elements such as shell plating including bottom and bow plating, stern frame and rudder, sea chests and vlaves, propellers, etc. The shell plating is to be examined for excessive corrosion, or deterioration due to chafing or contact with the ground and for any undue unfairness or buckling. Special attention is to be paid to the connection between the bilge strakes and the bilge keels. Important plate unfairness or other deterioration which do not necessitate immediate repairs are to be recorded.

….

(d) Visible parts of propeller and stern bush bearing or shaft bracket (strut) bearing, are to be examined. The wear down of the bearing or the clearance between the propeller shaft or stern tube shaft and the bearing, are to be examined. The clearance in the stern bush and the efficiency of the ~~oil~~ gland, if fitted, are to be ascertained and recorded. For controllable pitch propellers, the Surveyor is to be satisfied with the fastenings and tightness of hub and blade sealing. Dismantling need not to be carried out unless considered necessary by the Surveyor.

Survey in place for the propeller shaft and stern tube shaft is to be carried out as per requirement of 2.3.6.

….

(f) Anchor and anchor chains are to be arranged and examined. Chain lockers are to be internally examined. The diameter of anchor chain cables is to be measured at Special Survey No. 2 and subsequent Special Survey.

Paragraph 2.3.4 has been amended as follows:

2.3 Surveys of Propeller Shafts and Tube Shafts

2.3.4 Propeller shaft condition monitoring **(PCM)**

~~Where oil lubricated propeller shaft arrangements with approved oil glands are fitted and the requirements of 2.3.5 of Part I of the Rules for Steel Ships are complied with, the class notation **PCM** may be assigned.~~

This paragraph is to provide requirements for condition monitoring of the ship's propeller shaft and propeller shaft bearing, including its lubrication. The scope of the class notation **PCM-OLW** provided an additional safety level related to the propeller shaft and propeller shaft bearing, including its lubrication by monitoring the temperature and lubricant conditon of this equipment. The class notation **PCM-OLW** is applicable for a ship with open loop water-lubricated propeller shaft.

(a) Open loop water-lubricated shaft (**PCM-OLW**)

Where requested by the Owner, the class notation **PCM-OLW** may be assigned to a ship whose propeller shaft specifically arranged with open loop water-lubricated stern tube bearings, provided the following requirements are complied with.

(i) The following documentation is to be submitted for approval.

(1) Arrangement of propeller shaft bearings
The information includes position and type of manual and remote wear down gauges/sensor(s) for aft propeller shaft bearing and type approval reference documents of the remote wear down sensor.

(2) Piping diagram of open loop water-lubricated system
The information includes lubrication system for stern tube bearing together with bearing manufacturer's specified quality of lubricant and provision for emergency supply of lubricant.

(3) Propeller shaft and bearing inspection procedure
The information includes location of inspection covers and borescope receptacles where required.

(4) Shaft alignment calcuation including maximum allowable wear down for aft propeller shaft bearing

(5) Arrangement for shaft corrosion protection, including shaft material and, if proposed, cladding, coatings, and liners that cover the entire shaft.

(6) Arrangement of stern tube system and external shaft protection, including location of external protective devices and details of supplementary cathodic protection where required.

(7) Documentation of stern tube bearing and lubricant alarm system

(8) Documents for reference:

- Details of type approval of aft propeller shaft bearings
- Details of coatings used for corrosion protection
- Shafting material specification

(ii) General requirements

(1) Propeller shaft is to be made out of approved corrosion resistant material or be provided with approved corrosion protection to cover and seal all parts of the shaft exposed to sea water where subjected to dynamic stresses. Approved corrosion protection involving coating is to be complemented by additional cathodic protection arrangement.

(2) For shafts constructed with material other than approved corrosion resistant steel and shafting installations with a combination of liners and protective coatings, provisions for alternative means of verifying satisfactory condition of all parts of the shaft, bearings, coating, sleeves and transient areas as applicable for respective installations in service are to be provided.
Inspection procedure is to be submitted and approved by the Society before assignment of the notation.
Alternative means of visual inspection should provide a similar level of information obtained from Shaft Survey Method 4 as specified in 2.3.2 of this Chapter.

Notes:

- A combination of inspection covers, removable bearing segments, methods using boroscope etc. are considered as alternative means.
- Shafts assembled with a continuous corrosion resistant liner fabricated in one piece do not require provisions for alternative means of inspection in service.

(3) Shaft alignment is to be approved in accordance with Chapter 6 in Part IV of the Rules for Steel Ships.

(4) Approved methods to remotely monitor the aft propeller shaft bearing performance and wear are to be provided with redundancy. Redundancy may be exempted if the hardware is designed to be replaced without withdrawal of the shaft and/or propeller.
When a single sensor is installed, at least a spare sensor is to be kept onboard the ship.
Hardware used for monitoring is to be type approved by the Society. Case-by-case approval may be acceptable as an alternative.

Note:
Static remote wear monitoring devices, i.e. sensors, are considered as suitable methods for bearing performance and wear monitoring. Static remote wear monitoring sensors provide a wear down measurement reading when the shaft is in a stopped condition.

(5) An arrangement for bearing wear down measurement is to be provided. A manual gauge (i.e. poker gauge) is acceptable. The history of measurements is to be documented in the record files.

(6) The rate of bearing wear is to be documented and trended on a monthly basis. The bearing wear down measurement, rate of wear and the remaining operation time to reach the wear down limits are to be recorded in the record file.
If monitoring indicates that the rate of wear or the deterioration in bearing performance requires immediate remedial actions, the Society is to be informed.

(7) Propeller shaft bearings are to be type approved for the application. Nominal surface bearing pressure for aft propeller shaft bearing is not to exceed 0.6 N/mm^2.

(8) Stern tube sealing devices are to be of a type which allow them to be replaced without withdrawal of the shaft or removal of the propeller. Open loop water-lubricated systems are normally with a forward stern tube seal only.

(9) The maximum allowable wear down of propeller shaft bearing is to be indicated by the manufacturer.

(10) Onboard procedure is to be in place to document and trend the rate of bearing wear monthly using reading obtained from performance monitoring devices. The procedure is to include identification of prospective deterioration of bearing performance with subsequent remedial actions within a pre-defined safe operating margin before exceeding the wear down limit or failure.

(11) A shaft grounding device is to be installed.

(12) Open bearings fitted in strut and A-bracket bearings without forced lubricated arrangement of adequate quality are to be designed to withstand external abrasive conditions.

(iii) Lubricant supply and monitoring

(1) The propeller shaft bearings are to be lubricated and cooled by a lubricant of adequate quality and circulation to ensure satisfactory operating conditions of the shaft, bearings and sealing arrangemnet.
Maximum design temperature of the lubricant supply shall be capable of maintaining the bearing temperature below the manufacturer's limits.
A lubricant of adequate quality is to comply with the minimun filtration requirements defined by the bearing manufacturer.

Note:
Filtration may not be applicable for bearing fitted in struts and A-brackets exposed to open sea from both ends where forced supply of lubricant is not feasible.

(2) Active components and filters in the lubricant system are to be provided with sufficient redundancy to ensure and uninterrupted service of the propulsion system.
Automatic start of pumps are to be arranged upon failure of circulation of the lubricant below acceptable limits.
Duplicated filters are to be provided with provisions for easy change over in service.

Note:
This does not apply for bearings fitted in struts and A-brackets exposed to open sea.

(3) Provisions for alternative means of lubricant supply are to be arranged to maintain a lubricant flow of adequate quality in the event of emergency.

Note:

Grounding is one of most common cases of emergency where sea chests may not necessarily provide clean water.

(4) Monitoring of lubricant temperature, flow and pressure are to be provided on the lubricant supply piping to the stern tube with means of warning.
Lubricant flow is to be maintained in all modes of operation including stopped condition. This is not applicable for bearings fitted in struts and A-brackets exposed to open sea from both ends where forced supply of lubricant is not feasible.

(5) Lubricant is to be continuously filtered to the specification specified by the bearing manufacturer.

(6) Consideration is to be given to design temperature of the lubricant since the critical pitting limit for the shaft material.

Note:
Consequential risk of shaft pitting from galvanic effect is regulated by the operating temperature of the lubricant.

(iv) Monitoring

Monitoring of open loop water-lubricated system is to be arranged according to the following table. The alarms and indications listed in the following table are to be provided at main control station. However, there is no main control station, the alarms and indication are to be installed at locations easily accessible to the crew.

Monitored Item	Alarm	Auto Start	Indication	Remarks
Lubricant flow	Low	X[(1)]		Refer to 2.3.4(a)(iii)(2) & (4) of this Chapter
Lubricant pressure	Low		X[(2)]	Refer to 2.3.4(a)(iii)(2) & (4) of this Chapter
Lubricant temperature at stern tube inlet	High		X[(2)]	Refer to 2.3.4(a)(iii)(4) of this Chapter
Aft bearing wear down			X[(2)]	Refer to 2.3.4(a)(ii)(4) of this Chapter

Notes:
(1) Automatic start of standby pump.
(2) Indicating the values.

(b) For maintenance of the **PCM-OLW** notation, Annual Survey is to be carried out as follows:

(i) For **PCM-OLW** notation

The survey is to include:

(1) Examination of the record file and documentation

- Verification that the aft stern tube bearing wear down measurements have been recorded monthly with respective wear rate calculations and remaining operational time to reach the wear down limits.
- If there are performed any overhauls or similar, this is to be recorded in the record file.
- Verification that manual wear down measurements have been taken and recorded at every dry-docking.

(2) Testing of alarm and automatic covering the following:

- Lubricant low flow
- Lubricant low pressure
- Automatic start of standby lubricant supply pump upon detection of low flow of lubricant
- Lubricant high temperature at Inlet
- Remote weardown monitoring sensor function

(3) Visual inspection of inboard shaft seal for leakage, as far as practicable.

(4) Verify:

- Functionality of propeller shaft grounding device.
- The manual wear down measurements and remote wear down monitoring readings are consistent with.
- Evidence that lubricant flow has been maintained during all operating conditions including stopped condition of the shaft.
- The lubricant filtering units are in satisfactory condition.

(5) When the ship in dry dock

Inspection using alternative means of ascertaining the condition of the shaft, coating, bearing and liners as applicable is to be carried out in accordance with approved procedures. See also 2.3.4(a)(ii)(2) of this Chapter.

Verification that the propeller is free of damage which may cause the propeller to be out of balance.

(6) If the In-Water Survey is carried out, external inspection of accessible parts of the propeller shaft is to be carried out with specific attention on the condition of the coating, where applicable. This applies for installations with external propeller shaft bearings with parts of tail shaft exposed to sea, e.g. struts and A-brackets etc.

(c) Where the notation **PCM-OLW** has been assigned, the propeller shaft need not be withdrawn at surveys as required by 1.6.8 provided all condition monitoring data is found to be within permissible limits and all exposed areas of the shaft are examined by a magnetic particle crack detection method. Where the Surveyor considers that the data presented is not entirely to his satisfaction the shaft will be required to be withdrawn in accordance with 1.6.8.

(d) For ships with **PCM-OLW** notation, the maximum propeller shaft survey interval required by 2.3.2 of this Part shall not exceed 15 years provided:

(i) Annual Surveys are carried out to the satisfaction of the Surveyor.

(e) Initial survey for existing ships obtaining **PCM-OLW** notation

(i) All systems required by 2.3.4(a) of this Part are to be examined and tested in accordance with the approval plans, and

(ii) Propeller shaft survey as per 2.3.2 of this Part is to be required including drawing the shaft and examining the entire shaft.

Paragraph 2.5.1 has been amended as follows:

2.5 Annual Surveys

2.5.1 Annual Surveys - hull

At each Annual Survey, the general condition of hull and equipment is to be examined so far as can be seen and placed in satisfactory condition as necessary, attention being paid to the following items:

(a) Examination of weather decks, ship side plating above water line, hatch covers and coamings and watertight penetrations.

(i) Confirmation is to be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey, where applicable.

(ii) Checking the satisfactory condition of hatch cover, hatch coaming plating and their stiffeners, where applicable.

(iii) Examination of the weld connection between air pipes and deck plating.

(iv) External examination of all air pipe heads installed on the exposed decks.

(v) Examination of flame screens on vents to all bunker tanks.

(vi) Examination of ventilators, including closing devices, if any.

….

(c) Protection of other openings

(i) Hatchways, manholes, and scuttles in freeboard and superstructure decks.

(ii) Machinery casings, skylights, fiddley covers, companionways and deckhouses protecting openings in freeboard or enclosed superstructure decks.

(iii) Portlights together with deadcovers, cargo ports, bow or stern access, chutes and similar openings in ship's sides or ends below the freeboard deck or in way of enclosed superstructures.

(iv) Ventilators, air pipes together with flame screens, scuppers and discharges serving spaces on or below the freeboard deck.

(v) Watertight bulkheads, bulkhead penetrations and wall of enclosed superstructure.

(vi) Weather-tight and watertight doors and closing appliances for all of the above including proper operation of such doors.

(d) Freeing ports together with bars, shutters and hinges.

(e) Protection of the crew

Bulwark, walkways, ~~G~~guard rails, lifelines, gangways, accommodation ladders with accessory wires, winches and gears and deck houses accommodating crew.

….

(m) Ship constructed of Fiber Reinforced Plastics (FRP)

In addition to the applicable requirements of the annual survey - hull is also to include the following:

(i) All accessible parts particularly liable to rapid deterioration.

(ii) The deck to hull connection, and superstructure and deckhouse connections to the deck.

Paragraph 2.7.1(c) has been amended as follows:

2.7 Special Surveys

Procedures for class related services, see 2.1.4 of this Chapter.

Provision for surveys, see 2.1.5 of this Chapter.

A Survey planning meeting is to be held prior to the commencement of the survey.

Concurrent crediting to both Intermediate Survey (IS) and Special Survey (SS) for surveys and thickness measurements of spaces are not acceptable.

2.7.1 Special Survey - hull

All Annual Survey requirements together with the following are to be complied with:

(a) The examinations of the hull are to be supplemented by thickness measurements and testing as required in 2.7.1(j) and 2.7.1(k), to ensure that the structural integrity remains effective. The aim of the examination is to discover Substantial Corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

(b) A bottom survey in dry dock in accordance with the requirements of 2.2.1 of this Chapter is to be carried out as part of the Special Survey.

(c) The anchors and chain cables are to be ranged, examined and the required complement and condition verified. The chain locker holdfasts, hawse pipes and chain stoppers are to be examined and pumping arrangements of the chain locker tested.

At Special Survey No. 2 and subsequent Special Surveys, chain cables are to gauged and renewed in cases where their mean diameter is 12% worn below the ~~requirement limits allowed by the Society~~ original required nominal diameter.

(o) Bow doors, inner doors, side shell doors and stern doors, where applicable, are to be surveyed as per Special Survey, see IACS UR Z24-3.

Section 2.9 has been amended as follows:

2.9 Hull Surveys of ~~Ship~~ High Speed Craft for FRP and Aluminum Alloys Construction

2.9.1 Annual Survey

(a) For Craft ~~ships~~ of Fiber Reinforced Plastic (FRP) Construction, in addition to the applicable requirements of 2.5 of this Part, the Annual Survey - Hull is to include the following:

(i) All accessible parts particularly liable to rapid deterioration.

~~(ii) The ship is to be placed in drydock or slipway and all applicable items of the Annual Survey - Hull are to be examined.~~

(~~iii~~ ii) The deck-to-hull connection, and superstructure and deckhouse connections are to be examined.

(~~iv~~ iii) The ship is to be thoroughly checked and sounded for any apparent delaminations.

Where it is thought a delamination is found, a 50 mm diameter plug is to be removed from the area and examined for core to skin adhesion and water permeation.

(b) For Craft ~~ships~~ of Aluminum Alloys Construction, in addition to the applicable requirements of 2.5 of this Part, the Annual Survey - Hull is to include the following:

(i) All parts liable to rapid deterioration, particularly areas adjacent to dissimilar metals which are in close proximity.

(ii) In lieu of ballast tanks and combined cargo/ballast tanks, internal structure of a randomly selected cargo space, dry or liquid, together with any other space deemed necessary by the Surveyor, with particular attention to be given to bilges and drain wells.

~~(c) For ships subject to HSC Code, in addition to the applicable requirements of 2.5 of this Part, Bottom Survey in dry dock is to be a part of the Annual Survey as required by 2.2.1 of this Part.~~

2.9.2 Special Survey

In addition to the Annual Survey in 2.9.1 above and the applicable requirements of Special Survey in 2.7 of this Part, the Special Survey is to include the following:

(a) Requirements for Craft ~~ships~~ of Fiber Reinforced Plastic (FRP) Construction

(i) Engine foundations and their attachments to the hull are to be examined.

(ii) If considered necessary by the attending Surveyor, a~~A~~ minimum of five plugs, each 50 mm in diameter, are to be removed from the hull bottom and topsides from locations deemed appropriate from the attending Surveyor and examined for core to skin adhesion and water permeation.

(iii) The framing and holds, hull laminate of the tween deck, deep tanks, peaks, bilges and drain wells, and machinery spaces are to be cleaned and examined. Linings, ceiling, tanks, and portable ballast are to be removed as considered necessary by the attending Surveyor.

(iv) Where there is evidence of cracking, distortion, wetness, or delamination, destructive or nondestructive testing and removal and repair of the defect is subject to the discretion of the attending Surveyor.

(v) The hull, fastenings, and backing reinforcements in way of hull fittings and attachments are to be examined. Fastenings are to be withdrawn as considered necessary by the attending Surveyor.

(vi) The efficiency of hand pumps or other drainage arrangements for end spaces is to be tested.

(vii) Additionally for Sailing and Unpowered Ships, where applicable, ballast-keel fastenings and all openings to the sea, including sanitary and other overboard discharges, together with the cocks and valves connected therewith, are to be examined while the ship is in drydock. Mast foundation and connection to the hull are to be examined.

(b) Requirements for Craft ~~ships~~ of Aluminum Alloys Construction

In addition to the applicable requirements of Special Survey in 2.7, particular attention is to be given to insulation material in joints of shell connections between dissimilar metals, which is to be found or made effective as necessary.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF COAST GUARD SHIPS 2025"

PART II HULL CONSTRUCTION AND EQUIPMENT

List of major changes in Part II from 2025 edition

1.6.8	New	33.6.3(d)(i)	Revised
1.13.4(a)	Revised		
Table II 1-5	Revised		
Table II 1-7	Revised		
Table II 1-8~1-10	Revised		
10.6.4	New		
12.5	New		
12A.1	Revised and Renumbered		
12A.4.5(a)	Revised		
12A.4.6	Revised		
12A.4.7(a)	Revised		
13.1.2(d)	New		
16.2.4(a)	Revised		
22.1.4(a)	Revised		
24.1.4(b)	Revised		
Fig. II 24-4	Revised		
24.5.2(a)	Revised		
Fig. II 24-7	Revised		
Fig. II 24-7B	New		
Fig. II 24-7C	New		
Fig. II 24-8	Revised		
24.5.4(b) & (c)	Revised		
24.6.5	Revised		
24.7.2	Revised		
Table II 24-3	Revised		
25.1.3	Revised		
30.6.1(c)	New		

Chapter 1 General

Paragraph 1.6.8 has been added as follows:

1.6 Scantlings

1.6.1 The midship part and end parts of the ship used when describing the location of structural members and their scantlings are defined in 1.2.13 and 1.2.14 respectively.

1.6.2 Unless specified otherwise, scantlings of structural members of the midship part can be reduced gradually over the length of 0.1L afore and abaft.

......

1.6.7 Group of stiffeners

Scantlings of stiffeners based on requirements in this Part may be decided based on the concept of grouping designated sequentially placed stiffeners of equal scantlings on a single stiffened panel. The scantling of the group is to be taken as the greater of the following:

- The average of the required scantling of all stiffeners within a group.
- 90% of the maximum scantling required for any one stiffener within the group.

1.6.8 Rounding of calculated thickness

The required thickness, t, is given by rounding the calculated plate thickness to the nearest half millimeter. For example:

- For $10.75 \leq t_{calc} < 11.25$ mm, the Rule required thickness is 11.0 mm.
- For $11.25 \leq t_{calc} < 11.75$ mm, the Rule required thickness is 11.5 mm.

Paragraph 1.13.4(a) has been amended as follows:

1.13 Structural Details

1.13.4 Sheerstrake and bulwarks

(a) Where an angled gunwale is fitted, the top edge of the sheerstrake is to be kept free of all notches and isolated welded fittings. Fixtures of deck fittings such as bulwarks and eye plates ~~Bulwarks~~ are not to be welded to the top of the sheerstrake ~~within the 0.5L amidships~~ except within 0.1 L from A.E. and F.E. Drainage openings with a smooth transition in the longitudinal direction may be permitted. The design of the fittings shall be such as to minimise stress concentrations, with a smooth transition towards deck level. For ships with low/moderate hull girder stress, such details will be considered on a case-by-case basis.

(b) Where a rounded gunwale is adopted, the welding of fairlead stools and other fittings to this plate is to be kept to the minimum, and the design of the fittings is to be such as to minimise stress concentration.

(c) Arrangements are to ensure a smooth transition from rounded gunwale to angled gunwale towards the ends of the ship.

(d) At the ends of superstructures where the side plating is extended and tapered to align with the bulwark plating, the transition plating is to be suitably stiffened and supported. Where freeing ports or other openings are essential in this plate, they are to be suitably framed and kept well clear of the free edge.

Table II 1-5 has been amended as follows:

Table II 1-5
Minimum Material Grades for Ships with Length Exceeding ~~2~~150 m

Structural member category	Material grade
Shear strake at strength deck(1)	Grade E/EH within 0.4L amidships
Stringer plate in strength deck(1)	Grade E/EH within 0.4L amidships
Bilge strake(1)	Grade D/DH within 0.4L amidships

(1) Single strakes required to be of Grade D/DH or Grade E/EH and within 0.4L amidships are to have breadths not less than 800+5L (mm), need not be greater than 1800 (mm), unless limited by the geometry of the ship's design.

Table II 1-7 has been amended as follows:

Table II 1-7
Application of Material Classes and Grades – Structures Exposed at Low Temperature

Structural member category	Material class	
	Within 0.4L amidships	Outside 0.4L amidships
SECONDARY: Deck plating exposed to weather, in general Side plating above BWL Transverse bulkheads above BWL(5)	I	I
PRIMARY: Strength deck plating(1) Continuous longitudinal members above strength deck, excluding longitudinal hatch coamings Longitudinal bulkhead above BWL(5) Top wing tank bulkhead above BWL(5)	II	I
SPECIAL: Sheer strake at strength deck(2) Stringer plate in strength deck(2) Deck strake at longitudinal bulkhead(3) Continuous longitudinal hatch coamings(4)	III	II

Note:
(1) Plating at corners of large hatch openings to be specially considered. Class III or Grade E/EH to be applied in positions where high local stresses may occur.
(2) Not to be less than Grade E/EH within 0.4L amidships in ships with length exceeding 250 m.
(3) In ships with breadth exceeding 70 m at least three deck strakes to be Class III.
(4) Not to be less than Grade D/DH.
(5) Applicable to plating attached to hull envelope plating exposed to low air temperature. At least one strake is to be considered in the same way as exposed plating and the strake width is to be at least 600 mm.

The material grade requirements for hull members of each class depending on thickness and design temperature are defined in Table II 1-8 to Table II 1-10. For design temperatures $t_D < -55$°C, materials are to be specially considered by each Classification Society.

Table II 1-8~1-10 have been amended as follows:

Table II 1-8
Material Grade Requirements for Classes I at Low Temperature

~~Temperature~~	~~-20 / -25 ºC~~		~~-26 / -35 ºC~~		~~-36 / -45 ºC~~		~~-45 / -55 ºC~~	
~~As-built thickness, in mm~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~
~~$t \leq 10$~~	~~A~~	~~AH~~	~~B~~	~~AH~~	~~D~~	~~DH~~	~~D~~	~~DH~~
~~$10 < t \leq 15$~~	~~B~~	~~AH~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~D~~	~~DH~~
~~$15 < t \leq 20$~~	~~B~~	~~AH~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~
~~$20 < t \leq 25$~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~
~~$25 < t \leq 30$~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~
~~$30 < t \leq 35$~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~
~~$35 < t \leq 45$~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~
~~$45 < t \leq 50$~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~

~~Note :~~
~~NSS : Normal strength steel~~
~~HSS : Higher strength steel~~

Temperature	-11 / -15 ºC		-16 / -25 ºC		-26 / -35 ºC		-36 / -45 ºC		-46 / -55 ºC	
Plate thickness, in mm	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT
$t \leq 10$	A	AH	A	AH	B	AH	D	DH	D	DH
$10 < t \leq 15$	A	AH	B	AH	D	DH	D	DH	D	DH
$15 < t \leq 20$	A	AH	B	AH	D	DH	D	DH	E	EH
$20 < t \leq 25$	B	AH	D	DH	D	DH	D	DH	E	EH
$25 < t \leq 30$	B	AH	D	DH	D	DH	E	EH	E	EH
$30 < t \leq 35$	D	DH	D	DH	D	DH	E	EH	E	EH
$35 < t \leq 45$	D	DH	D	DH	E	EH	E	EH	-	FH
$45 < t \leq 50$	D	DH	E	EH	E	EH	-	FH	-	FH

Table II 1-9
Material Grade Requirements for Classes II at Low Temperature

~~Temperature~~	~~-20 / -25 ºC~~		~~-26 / -35 ºC~~		~~-36 / -45 ºC~~		~~-45 / -55 ºC~~	
~~As-built thickness, in mm~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~
~~$t \leq 10$~~	~~B~~	~~AH~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~
~~$10 < t \leq 20$~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~
~~$20 < t \leq 30$~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~
~~$30 < t \leq 40$~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~
~~$40 < t \leq 45$~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~	~~-~~	~~-~~
~~$45 < t \leq 50$~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~	~~-~~	~~-~~

~~Note :~~
~~NSS : Normal strength steel~~
~~HSS : Higher strength steel~~

Temperature	-11 / -15 ºC		-16 / -25 ºC		-26 / -35 ºC		-36 / -45 ºC		-46 / -55 ºC	
Plate thickness, in mm	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT
$t \leq 10$	A	AH	B	AH	D	DH	D	DH	E	EH
$10 < t \leq 20$	B	AH	D	DH	D	DH	E	EH	E	EH
$20 < t \leq 30$	D	DH	D	DH	E	EH	E	EH	-	FH
$30 < t \leq 40$	D	DH	E	EH	E	EH	-	FH	-	FH
$40 < t \leq 45$	E	EH	E	EH	-	FH	-	FH	-	-
$45 < t \leq 50$	E	EH	E	EH	-	FH	-	FH	-	-

Table II 1-10
Material Grade Requirements for Classes III at Low Temperature

~~Temperature~~	~~-20 / -25 °C~~		~~-26 / -35 °C~~		~~-36 / -45 °C~~		~~-45 / -55 °C~~	
~~As-built thickness, in mm~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~	~~NSS~~	~~HSS~~
~~$t \leq 10$~~	~~D~~	~~DH~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~
~~$10 < t \leq 20$~~	~~D~~	~~DH~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~
~~$20 < t \leq 25$~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~E~~	~~FH~~	~~-~~	~~FH~~
~~$25 < t \leq 30$~~	~~E~~	~~EH~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~
~~$30 < t \leq 35$~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~	~~-~~	~~-~~
~~$35 < t \leq 40$~~	~~E~~	~~EH~~	~~-~~	~~FH~~	~~-~~	~~FH~~	~~-~~	~~-~~
~~$40 < t \leq 50$~~	~~-~~	~~FH~~	~~-~~	~~FH~~	~~-~~	~~-~~	~~-~~	~~-~~
~~Note :~~ ~~NSS : Normal strength steel~~ ~~HSS : Higher strength steel~~								

Temperature	-11 / -15 °C		-16 / -25 °C		-26 / -35 °C		-36 / -45 °C		-46 / -55 °C	
Plate thickness, in mm	MS	HT	MS	HT	MS	HT	MS	HT	MS	HT
$t \leq 10$	B	AH	D	DH	D	DH	E	EH	E	EH
$10 < t \leq 20$	D	DH	D	DH	E	EH	E	EH	-	FH
$20 < t \leq 25$	D	DH	E	EH	E	EH	E	FH	-	FH
$25 < t \leq 30$	D	DH	E	EH	E	EH	-	FH	-	FH
$30 < t \leq 35$	E	EH	E	EH	-	FH	-	FH	-	-
$35 < t \leq 40$	E	EH	E	EH	-	FH	-	FH	-	-
$40 < t \leq 50$	E	EH	-	FH	-	FH	-	-	-	-

Table II 1-11
Brackets (Unit: mm)

Length of longer arm	Thickness		Breadth of flange	Length of longer arm	Thickness		Breadth of flange
	Plane	Flanged			Plane	Flanged	
150	6.5	-	-	700	14.0	9.5	70
200	7.0	6.5	30	750	14.5	10.0	70
250	8.0	6.5	30	800	-	10.5	80
300	8.5	7.0	40	850	-	11.0	85
350	9.0	7.0	40	900	-	11.0	90
400	10.0	8.0	50	950	-	11.5	90
450	10.5	8.0	50	1000	-	11.5	95
500	11.0	8.5	55	1050	-	12.0	100
550	12.0	8.5	55	1100	-	12.5	105
600	12.5	9.0	65	1150	-	12.5	110
650	13.0	9.0	65				

Chapter 10
Deck Girders and Pillars

10.6 Pillars

Paragraph 10.6.4 has been added as follows:

10.6.1 The sectional area of pillars is to be determined from the following formula:

$$\frac{W}{k - \frac{nl}{r}} \quad \text{cm}^2$$

where:

l	=	The distance from the top of the inner bottom, deck or other structure on which the pillar is based to the under side of the beam or girder supported, in m.
r	=	The least radius of gyration, in cm.
W	=	Deck load supported by the pillar, in kN.
	=	$9.81S\ b\ h + W_o$
S	=	The mean length of the area supported by the pillar, in m.
b	=	The mean width of the area supported by the pillar. Normally the minimum value of b is to be taken as 0.2 B, in m.
h	=	Deck height for the area supported as defined in the 9.2.1 of this Part, in m.
W_o	=	Deck load of the upper tween deck pillar above the lower pillar in question, as defined in 10.6.2 of this Chapter, in kN.
k	=	12.09 for mild steel
	=	16.11 for HT32
	=	18.12 for HT36
n	=	4.44 for mild steel
	=	7.47 for HT32
	=	9.00 for HT36

10.6.2 Load of upper pillar

(a) Where no pillar is fitted in the tween deck space directly above the deck supported by the pillar in question, W_o is equal to zero.

(b) Where the pillar is fitted in the tween deck space directly above the deck supported by the pillar in question, W_o is to be taken equal to W for the tween deck pillar.

(c) Where the pillar is not directly in line with those above or not on the line of the girder but which supports the load from above or the deck girder through a system of supplementary fore and aft or transverse girder, W_o is to be the actual load transmitted to the pillar in question through the system of the girder.

10.6.3 The pillar under the top of the deep tank is to be of solid section and of a size not less than that required by 10.6.1 or the sectional area required by the following formula, whichever is the greater:

$1.09\ kS\ b\ h\ \ cm^2$

where:
S and b are as specified in 10.6.1 of this Part.

k = 1.00 for mild steel
  = 0.75 for HT32
  = 0.67 for HT36

h = The vertical distance, in m, from the top of the tank to the load line, or to 2/3 of the depth to the freeboard or bulkhead deck, or to1/2 of the height from the tank top to the overflow pipe, whichever is the greatest.

10.6.4 For stainless steel or stainless clad steel pillars, refer to the requirements specified in 11.7 of Part XV of the Rules for Steel Ships.

Chapter 12
Superstructures and Deckhouses

Section 12.5 has been added as follows:

12.5 Aluminum Superstructures and Deckhouses

12.5.1 Scantlings

Where deckhouses are constructed of aluminum alloys, the required plate thickness and stiffener section modulus, SM, are first to be determined as required for mild steel superstructures and deckhouses, and are then to be increased by the material factor, $(235/Y_{aw})^{0.50}$ or $235/Y_{aw}$, as indicated below.

For all deck and bulkhead plating and stiffeners, the required thickness and section modulus for aluminum alloy plate and shapes are obtained from the following equations:

Plating:

$$t_{al} = t_s \left(\frac{Y_S}{Y_{aw}}\right)^{0.5} \quad \text{mm}$$

Stiffeners:

$$SM_{al} = \frac{Y_S}{Y_{aw}} SM_S \quad \text{cm}^3$$

where:

t_{al}	=	minimum thickness of aluminum plate.
t_s	=	required plate thickness for steel obtained from 12.2.2 and 12.3.2
SM_{al}	=	minimum section modulus of aluminum stiffeners.
SM_S	=	minimum section modulus of steel stiffeners, as determined from Chapter 9 and Chapter 10 for deck stiffeners and 12.3.1 for bulkhead stiffeners.
Y_S	=	235 N/mm^2
Y_{aw}	=	minimum yield strength of the welded aluminum alloy under consideration at 0.20% offset in N/mm^2

In addition, the aluminum stiffeners are to have a depth not less than that given below:

$$d_{al} = 3SM_S \frac{d_S}{SM_{al}}$$

where

d_{al}	=	minimum required depth for aluminum stiffeners.
d_S	=	minimum required depth for steel stiffeners; not to be less than 100 mm depth for fronts and 80 mm for sides and ends.

Chapter 12A Helicopter Decks and Facilities

Section 12A.1 has been amended and renumbered as follows:

12A.1 General

12A.1.1 The structure of the helicopter deck is to be designed to suit landing of the largest type of helicopter intended to use.

12A.1.2 Ships with helicopter decks built in accordance with these rules are to be assigned a class notation "Helideck" affixed to classification symbols, which is classified into four classes: **Helideck-I**, **Helideck-II**, **Helideck-III** and **Helideck-IV**.

12A.1.3 Where the requirements of the Rules have been complied with for an area on a ship designated for occasional or emergency landing of helicopters, the ship is to be assigned a class notation **Occasional Helicopter Landing Area**.

12A.1.4 Class notation **Occasional Helicopter Landing Area** requires compliance with the requirements given in 12A.1, 12A.2, 12A.3 and SOLAS Reg. II-2/18.2.2, 18.2.3.

~~12A.1.3~~12A.1.5 Class notation **Helideck-I** requires compliance with the requirements given in 12A.1, 12A.2, 12A.3 and 12A.4.

~~12A.1.4~~12A.1.6 Class notation **Helideck-II** requires compliance with the requirements given in 12A.5, in addition to the requirements for **Helideck-I**.

~~12A.1.5~~12A.1.7 Class notation **Helideck-III** requires compliance with the requirements given in 12A.6, in addition to the requirements for **Helideck-II**.

~~12A.1.6~~12A.1.8 Class notation **Helideck-IV** requires compliance with the requirements given in 12A.7, in addition to the requirements for **Helideck-III**.

~~12A.1.7~~12A.1.9 Details of the helicopter types to be used are to be included in the Loading Manual (See 3.1.2), and be contained in a notice displayed on the helicopter landing deck.

~~12A.1.8~~12A.1.10 The attention of owners, builders and designers is drawn to various international and governmental regulations and guides regarding the operational and other design requirements for helicopters landing on ships.

~~12A.1.9~~12A.1.11 Construction of helicopter decks

……

~~12A.1.10~~12A.1.12 Definition

(a) Helicopter deck is a purpose built helicopter landing area located on a ship including all structure, fire-fighting appliances and other equipment necessary for the safe operation of helicopters.

(b) Helicopter facility is a helicopter deck including any refueling and hangar facilities.

(c) Helicopter landing area is an area on a ship designated for occasional or emergency landing of helicopters but not designed for routine helicopter operations.

12A.4 Arrangements

……

Paragraph 12A.4.5(a) has been amended as follows:

12A.4.5 For applicable requirements regarding m~~M~~eans of escape, refer to 13.1.3 of Part IX of the Rules for Steel Ships

~~(a) A helicopter deck is to be provided with both a main and an emergency means of escape and access for fire fighting and rescue personnel. These are to be located as far apart from each other as is practicable and preferably on opposite sides of the helicopter deck.~~

Paragraph 12A.4.6 has been amended as follows:

12A.4.6 For applicable requirements regarding fire fighting appliance, refer to 13.1.4 of Part IX of the Rules for Steel Ships ~~Drainage facilities~~

~~(a) Drainage facilities in way of helicopter decks are to be constructed of steel and are to lead directly overboard independent of any other system and are to be designed so that drainage does not fall onto any part of the ship.~~

Paragraph 12A.4.7(a) has been amended as follows:

12A.4.7 ~~Fire-fighting appliances~~For applicable requirements regarding drainage facilities, refer to 13.1.5 of Part IX of the Rules for Steel Ships

~~(a) In close proximity to the helicopter deck, the following fire-fighting appliances are to be provided and stored near the means of access to that helicopter deck:~~

~~(i) at least two dry powder extinguishers having a total capacity of not less than 45 kg;~~

~~(ii) carbon dioxide extinguishers of a total capacity of not less than 18 kg or equivalent;~~

~~(iii) a suitable foam application system, with the requirements of IMO MSC.1/Circ.1431 consisting of monitors or foam making branch pipes capable of delivering foam to all parts of the helicopter deck in all weather conditions in which helicopters can operate. The system is to be capable of delivering a discharge rate as required in Table II 12A-4 for at least five minutes;~~

~~Table II 12A-4~~
~~Foam Discharge Rates~~

~~Category~~	~~Helicopter overall length~~	~~Discharge rate foam solution (l/min.)~~
~~H1~~	~~up to but not including 15 m~~	~~250~~
~~H2~~	~~from 15m up to but not including 24 m~~	~~500~~
~~H3~~	~~from 24m up to but not including 35 m~~	~~800~~

~~(iv) the principal agent is to be suitable for use with salt water, and a type deemed as appropriate by the Society.~~

~~(v) at least two nozzles of an approved dual-purpose type (jet/spray) and hoses sufficient to reach any part of the helicopter deck.~~

~~(vi) in addition to the requirements of SOLAS Reg. II-2/10.10, two sets of fire-fighter's outfits; and~~

~~(vii) at least the following equipment is to be stored in a manner that provides for immediate use and protection from the elements:~~

~~(1) adjustable wrench;~~

~~(2) blanket, fire resistant;~~

~~(3) cutters, bolt 60 cm;~~

~~(4) hook, grab or salving;~~

~~(5) hacksaw, heavy duty complete with 6 spare blades;~~

~~(6) ladder;~~

~~(7) lift line 5 mm diameter × 15 m in length;~~

~~(8) pliers, side cutting;~~

~~(9) set of assorted screwdrivers; and~~

~~(10) harness knife complete with sheath.~~

Chapter 13
Bulwarks, Freeing Ports, Side Scuttles, Shell Doors and Gangways

Paragraph 13.1.2(d) has been added as follows:

13.1 Bulwarks and Guardrails

……

13.1.2 Bulwark constructions

……

(d) The section modulus at the bottom of bulwark stays is not to be less than that obtained from the following formula:

$(30+0.45L)Sh^2K$ cm^3

where:

S = spacing of stays, in m;
L = length of ship, in m, not to be taken as greater than 100 m;
h = height of bulwark, in m;
K = material factor.

Where the flange of the stay is not welded to the deck, such a flange is not to be considered for the section modulus.

Chapter 16
Deep Tanks

16.2 Deep Tank Bulkheads

Paragraph 16.2.4(a) has been amended as follows:

16.2.4 Corrugated Bulkheads

(a) The thickness of plates of corrugated bulkheads is not to be less than that obtained from the following formula:

$$3.6CS_1\sqrt{Kh} + 3.5 \quad \text{mm}$$

where:

S_1	=	As specified in 14.2.4(a) of this Part.
h	=	As specified in 16.2.2 of this Chapter.
C	=	Coefficient given below:
	=	$\dfrac{1.4}{\sqrt{1+\left(t_w/t_f\right)^2}}$ for face part
	=	1.0 for web part
t_f and t_w	=	As specified in 14.2.4(a) of this Part.
K	=	Material factor as specified in 1.5.2(a) of this Part

Chapter 22
Scuppers and Sanitary Discharges

22.1 Scuppers and Sanitary Discharges

Paragraph 22.1.4(a) has been amended as follows:

22.1.4 Automatic non-return valves

(a) Non-return valves

Normally each separate discharge is to have one automatic non-return valve with positive means of closing it from a position above the freeboard deck. Where the inboard end of the discharge pipe is located at least $0.01L_f$ above the Summer Load Line, the discharge may have two automatic non-return valves without positive means of closing. Where that vertical distance exceeds $0.02L_f$, a single automatic non-return valve without positive means of closing may be accepted. The means for operating the positive action valve are to be readily accessible and provided with an indicator showing whether the valve is open or closed.

Chapter 24
Rudders

<u>*Paragraph 24.1.4(b) has been amended as follows:*</u>

24.1 General

24.1.4 Welding and design details

……

(b) In way of the rudder horn recess of semi-spade rudders, the radii in the rudder plating except in way of solid part in cast steel are not to be less than 5 times the plate thickness, but in no case less than 100 mm. Welding in side plate is to be avoided in or at the end of the radii. Edges of side plate and weld adjacent to radii are to be ground smooth.

<u>*Fig. II 24-4 has been amended as follows:*</u>

24.2 Rudder Force and Rudder Torque

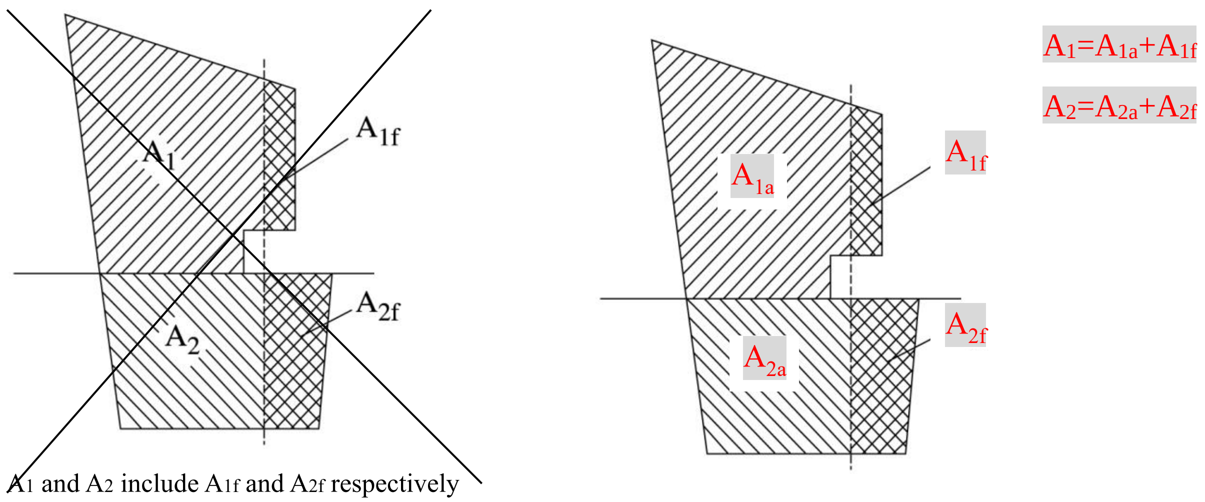


Fig. II 24-4
Rudder Blade with Cutouts

Paragraph 24.5.2(a) has been amended as follows:

24.5 Rudder Stock Couplings

24.5.2 Cone couplings with key

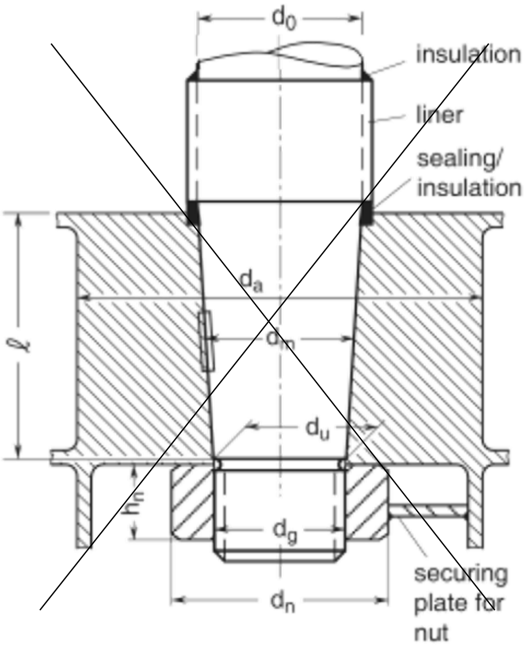
(a) Cone couplings without hydraulic arrangements for mounting and dismounting the coupling should have a taper c on diameter of 1:8 - 1:12, where:

$$c = \frac{d_0 - d_u}{l_c}$$ (see Fig. II 24-7A ~ Fig. II 24-7C of this Chapter)

The diameters d_0 and d_u are shown in Fig. II 24-7A and the cone length l_c is defined in Fig. II 24-7C.

The cone coupling is to be secured by a slugging nut. The nut is to be secured, e.g. by a securing plate.

Fig. II 24-7 has been amended as follows:



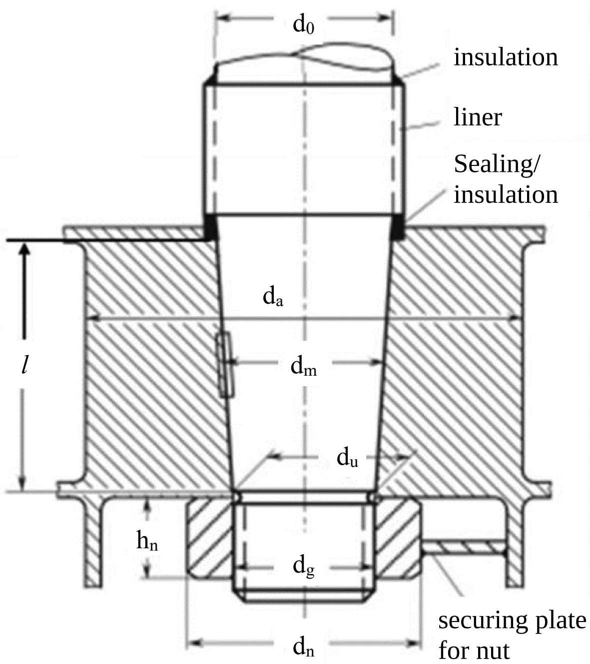


Fig. II 24-7A
Cone Coupling with Key

Fig. II 24-7B has been added as follows:

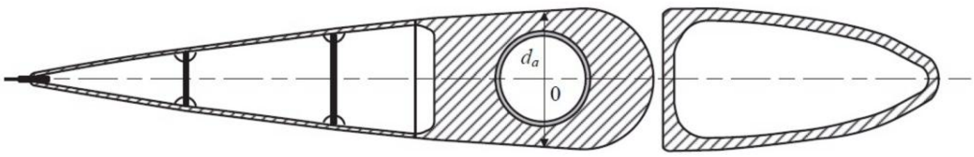


Fig. II 24-7B
Gudgeon Outer Diameter(d_a) Measurement

Fig. II 24-7C has been added as follows:

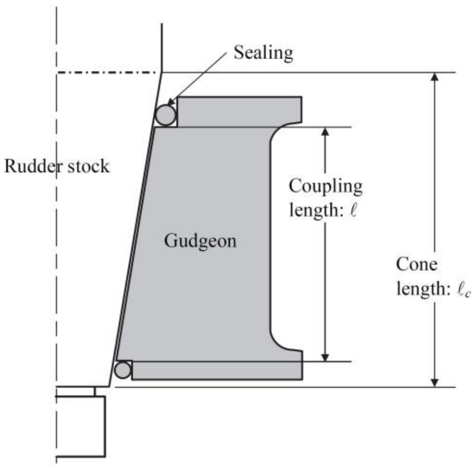


Fig. II 24-7C
Cone Length and Coupling Length

<u>Fig. II 24-8 has been amended as follows:</u>

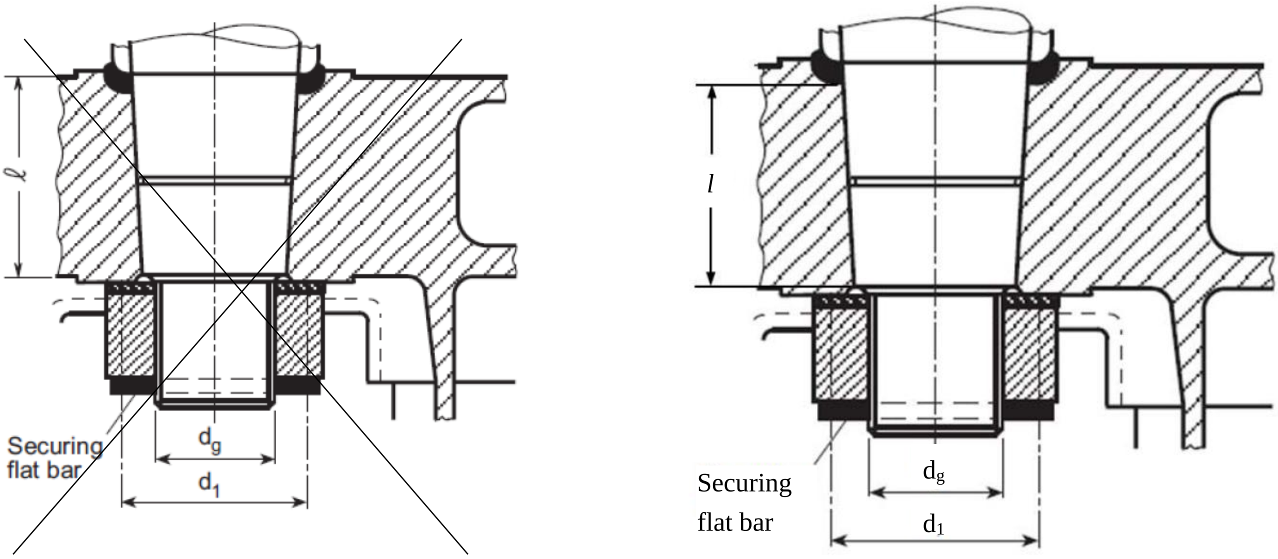


Fig. II 24-8
Cone Coupling without Key

Paragraphs 24.5.4(b) & (c) have been amended as follows:

24.5.4 Cone couplings with special arrangements for mounting and dismounting the couplings

(a) ......

(b) Push-up pressure

The push-up pressure, is not to be less than the greater of the two following values:

$$p_{req1} = \frac{2Q_F}{d_m^2 l \pi \mu_0} 10^3 \qquad N/mm^2$$

$$p_{req2} = \frac{6M_b}{l^2 d_m} 10^3 \qquad N/mm^2$$

where:

Q_F = design yield moment of rudder stock, as defined in 24.5.2(i) of this Chapter, in Nm

d_m = mean cone diameter in mm, see Fig. II 24-7A of this Chapter

l = cone length in mm

μ_0 = frictional coefficient, equal to 0.15

M_b = bending moment in the cone coupling (e.g. in case of spade rudders), in Nm

It has to be proved by the designer that the push-up pressure does not exceed the permissible surface pressure in the cone. The permissible surface pressure, in N/mm^2, is to be determined by the following formula:

$$\cancel{p_{perm} = \frac{0.8R_{eH}(1-a^2)}{\sqrt{3+a^4}} \qquad N/mm^2}$$

$$p_{perm} = \frac{0.95R_{eH}(1-a^2)}{\sqrt{3+a^4}} - p_b \qquad N/mm^2$$

where:

p_b = $\frac{3.5M_b}{d_m l^2} 10^3$

R_{eH} = minimum yield stress of the material of the gudgeon in N/mm^2

a = d_m / d_a

d_m = diameter, in mm, see Fig. II 24-7A of this Chapter

d_a = outer diameter of the gudgeon, in mm ~~to be not less than 1.5 d_m~~, see Fig. II 24-7A and Fig. II 24-7B of this Chapter. (The least diameter is to be considered).

The outer diameter of the gudgeon in mm shall not be less than 1.25 d_0 , with d_0 defined in Fig. II 24-7A.

(c) Push-up length

The push-up length Δl, in mm, Δl is to comply with the following formula:

$$\Delta l_1 \leq \Delta l \leq \Delta l_2$$

where:

$$\Delta l_1 = \frac{p_{req} d_m}{E\left(\frac{1-a^2}{2}\right)c} + \frac{0.8R_{tm}}{c} \quad \text{mm}$$

$$\Delta l_2 = \cancel{\frac{1.6R_{eH} d_m}{Ec\sqrt{3+a^4}}} \frac{p_{perm} d_m}{E\left(\frac{1-a^2}{2}\right)c} + \frac{0.8R_{tm}}{c} \quad \text{mm}$$

R_{tm} = mean roughness, in mm taken equal to 0.01

c = taper on diameter according to 24.5.4(a) of this Chapter

E = Young's modulus of the material of the gudgeon, in N/mm^2

d_m, $\cancel{R_{eH}}$, a, p_{req}, p_{perm} = As specified in 24.5.4(b) above.

Notwithstanding the above, the push up length is not to be less than 2 mm.

Note: In case of hydraulic pressure connections the required push-up force P_e , in N, for the cone may be determined by the following formula:

$$P_e = p_{req} d_m \pi l \left(\frac{c}{2} + 0.02\right)$$

The value 0.02 is a reference for the friction coefficient using oil pressure. It varies and depends on the mechanical treatment and roughness of the details to be fixed. Where due to the fitting procedure a partial push-up effect caused by the rudder weight is given, this may be taken into account when fixing the required push-up length, subject to approval by the Society.

Paragraphs 24.6.5 have been amended as follows:

24.6 Pintles

24.6.1 The minimum pintle diameter is to be as follows:

$$d_p = 0.35\sqrt{BK_p} \quad \text{mm}$$

where:

B = The reaction force in bearing, in N.

K_p = Material factor for the pintle as specified in 1.5.2(c) of this Part.

…..

24.6.5 Push-up pressure for pintle bearings

The required push-up pressure p_{req} for pintle bearings, in N/mm², is to be determined by the following formula:

$$p_{req} = 0.4\frac{B_1 d_0}{d_m^2\, l}$$

where:

B_1 = Supporting force in the pintle bearing, in N

d_0 = Pintle diameter, in mm, see Fig. II 24-7A of this Chapter

The push up length is to be calculated similarly as in 24.5.4(c) of this Chapter, using required push-up pressure and properties for the pintle bearing.

Paragraph 24.7.2 has been amended as follows:

24.7 Rudder Stock Bearings, Rudder Shaft Bearing and Pintle Bearings

24.7.2 The length/diameter ratio of the bearing surface is not to be ~~less than 1.0 or~~ greater than 1.2~~, unless calculations are submitted and approved which show the clearance at both ends of the bearing is acceptable~~.

The bearing length L_p of the pintle, in mm, is to be such that:

$$D_p \leq L_p \leq 1.2D_p$$

where:

D_p = Actual pintle diameter, in mm, measured on the outside of liners.

Table II 24-3 has been amended as follows:

Table II 24-3
Allowable Surface Pressure, q_a

Bearing material	q_a (N/mm^2)
Lignum-vitae	2.5
White metal, oil lubricated	4.5
Synthetic material with hardness ~~between 60 and 70~~ greater than 60 Shore D(1)	5.5(2)
Steel(3) and bronze and hot-pressed bronze-graphite materials	7.0

Notes:
(1) Indentation hardness test at 23°C and 50% moisture, according to a recognized standard. Synthetic bearing materials are to be of an approved type.
(2) Surface pressures exceeding 5.5 N/mm^2 may be accepted in accordance with bearing manufacturer's specification and tests, but in no case more than 10 N/mm^2.
(3) Stainless and wear-resistant steel in an approved combination with stock liner. Higher values than given in the Table may be taken if they are verified by tests.

Chapter 25
Equipment

Paragraph 25.1.3 has been amended as follows:

25.1 General

25.1.1 All ships are to be provided with a complete equipment of the anchor, the chain, the towline and the mooring rope in accordance with the following requirements. The letter **E** will be placed after the symbol of classification of hull in the Register Book as **CR100 ✠ E**.

25.1.2 In the case of ships classed for a special or restricted service, if approved by the Society that requirements of the Rules are not necessary to apply, no equipment symbol is to be affixed.

25.1.3 The number and mass of anchors and the length and the size of the chain, the towline, and the mooring rope for a classed ship are to be determined from Table II 25-1. For ships having equipment numbers not more than 50 or more than 16,000, the number and mass of anchors, chain cables and mooring lines are to be determined by the Society. The total length of chain given in Table II 25-1 is to be divided in approximately equal parts between the two bower anchors.

……

25.1.5 The anchor, the chain, and the steel wire rope are to be tested and inspected in the presence of the Surveyor to the Society in accordance with the requirements of Part XI.

Chapter 30
Intact Stability

<u>Paragraph 30.6.1(c) has been added as follows:</u>

30.6.1 Stability curves and wind-heeling moment lever curves of ships are to comply with the following requirements in Fig. II 30-2.

(a) Heeling angle caused by steady wind is to be less than 16° or an angle corresponding to 80% of immersing angle of deck edge, whichever is less.

(b) Area "b" is not to be less than area "a".
where:

l_{w1} = Heeling moment lever caused by steady wind (m) given by the following formula:
$= \frac{0.0514AZ}{W}$
A = Projected lateral area of hull and cargoes on deck above waterline (m^2).
Z = Vertical distance between the centre of “A” and the centre of underwater projected lateral area of hull (m). In general, the centre of underwater projected lateral area may be approximated to locate at half the draught.
W = Displacement (ton).
l_{w2} = Heeling moment lever caused by gust (m) given by the following formula:
$= 1.5l_{w1}$
a = Area encircled by stability curve, l_{w2} and θ_r (m · rad).
b = Area encircled by stability curve, l_{w2} and θ_2 (m · rad).
θ_r = Angle of rolling stop motion (degree). In general, it may be given by the formula $(\theta_0 - \theta_1)$.
θ_c = Heeling angle at the second intersection between heeling moment lever (l_{w2}) and stability curve (degree).
θ_2 = Heeling angle (degree) to be taken of whichever is the least, down flooding angle, θ_c or 50°.
θ_0 = Angle of heel under action of steady wind (degree).
θ_1 = Angle of roll to windward due to wave action (degree) given by the following formula :
$= 109x_1x_2k\sqrt{rs}$
x_1 = Values obtained from Table II 30-1 according to the value of B/d. In case the value of B/d becomes intermediate, values are to be determined by interpolation.
x_2 = Values obtained from Table II 30-2 according to the value of C_b. In case the value of C_b becomes intermediate, values are to be determined by interpolation.
C_b = Block coefficient given by the following formula :
$= \frac{W}{1.025LBd}$
L = Length of the ship at waterline (m)
k = Values determined as follows;
= 1.0 for round-bilged ships having neither bilge keels nor bar keels,
= 0.7 for ships with sharp bilges,
For ships with bilge keel and/or bar keels: Values obtained from Table II 30-3 according to the value of $\frac{100A_k}{LB}$.
In case $\frac{100A_k}{LB}$ becomes intermediate, values are to be determined by interpolation.
A_k = Total area of bilge keels, projected lateral area of bar keels or sum of those areas (m^2).
r = Values obtained from the following formula.

However, the value of r need not be taken over 1.0.

$= 0.73 + 0.6\frac{OG}{d}$

OG = Distance between the centre of gravity and the waterline (m), and is taken as positive when the centre of gravity is above waterline.

S = Values obtained from Table II 30-4 according to the value of T. In case T becomes intermediate, values are to be determined by interpolation.

T = Rolling period (seconds) obtained from the following formula,

$$= \frac{2B}{\sqrt{G_0M}}\left(0.373 + 0.023\frac{B}{d} - 0.043\frac{L}{100}\right)$$

G_0M = As specified in 30.5.

(c) Alternative means for determining the wind heeling lever (lw1) may be accepted, to the satisfaction of the Society, as an equivalent to calculation in 30.6.1(b). When such alternative tests are carried out, reference shall be made based on the Guidelines developed by the Organization (MSC.1/Circ.1200). The wind velocity used in the tests shall be 26 m/s in full scale with uniform velocity profile. The value of wind velocity used for ships in restricted services may be reduced to the satisfaction of the Society.

Chapter 33
Sloshing

Paragraph 33.6.3(d)(i) has been amended as follows:

33.6 Design Sloshing Load for Ships with Length less than 100 Meters

……

33.6.3 Deck Structures Subjected to Sloshing

(a) Strength deck plating

The thickness requirement corresponding to lateral pressure is given by:

$$t = \frac{15.8 k_a s \sqrt{p}}{\sqrt{\sigma}} + t_c \qquad \text{mm}$$

where:

p = Design load for sloshing as given in 33.6.1

σ = As given in Table II 33-4.

….

(d) Simple girders

(i) The section modulus requirement for simple girders is given by:

$$Z = \frac{100 S^2 b p w_k}{\sigma} \qquad \text{cm}^3$$

where:

p = Design load for sloshing as given in 33.2.2(b)

b = Loading breadth, in m

σ = Allowable stress as given in 33.6.2(b) for longitudinal girders

= 160/K for other girders.

(ii) The web area requirement (after deduction of cut-outs) at the girder ends is given by:

$$A = 0.06 S b p + 10 h t_k \qquad \text{cm}^2$$

where:

p = As given in 33.6.3(d)(i)

b = As given in 33.6.3(d)(i)

h = Girder height, in m.

The web area at the middle of the span is not to be less than 0.5 A.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF COAST GUARD SHIPS 2025"

PART III HULL CONSTRUCTION AND EQUIPMENT FOR HIGH-SPEED CRAFT

List of major changes in Part III from 2025 edition

1.1.28	New
2.2.1(a) & 2.2.7~2.2.8	Revised and New
2.4.2(c)(ii)	Revised
2.4.3(f) & (g)	New and Renumbered
2.5.1(b)(i)	Revised
2.5.3(a)	Revised
2.7.6(b)	Revised
2.11.1(b)	Revised

Rules for the Construction and Classification of Coast Guard Ships 2025 have been partly amended as follows:

Chapter 1
General

1.1 Definition

Paragraph 1.1.28 has been added as follows:

1.1.1 Application

The following definitions of terms apply throughout the requirements in the Rules.

….

1.1.28 "Limit operating conditions" is to be taken to mean sea states (characterized only by their significant wave heights) compatible with the structural design parameters of the craft, i.e. the sea states in which the craft may operate depending on its actual speed.

Chapter 2
Hull Structures and Arrangements

2.2 Design Pressures

Paragraphs 2.2.1(a) & 2.2.7~2.2.8 have been amended and added as follows:

2.2.1 Monohulls

The bottom and side pressures are to be checked using the displacement (Δ), speed (V), draft (d), and running trim (τ) in the full load, half load, and light load conditions. If the craft is receiving a freeboard assignment, the parameters used in the full load condition are to coincide with the assigned freeboard. If the craft is not receiving a freeboard assignment, the parameters used in the full load condition are to correspond to the condition of the craft with the maximum operating deadweight. The parameters used in the half load condition are to correspond to the condition of the craft with 50% of the maximum operating deadweight, and the parameters used in the light load condition are to correspond to the condition of the craft with 10% of the maximum operating deadweight plus the maximum speed of the craft.

(a) Bottom Design Pressure

The bottom design pressure is to be the greater of those, as given in the following equations, for the location under consideration. Bottom structure design pressures are dependent upon the service in which the craft operates. The bottom design pressure applies to hull bottoms below the chines or the upper turn of the bilge.

(i) Bottom Slamming Pressure

$$P_{bcg} = \frac{N_1 \Delta}{L_w B_w}\left[1 + n_{cg}\right] F_D \qquad \text{kN/m}^2$$

$$P_{bxx} = \frac{N_1 \Delta}{L_w B_w}\left[1 + n_{xx}\right]\left[\frac{70 - \beta_{bx}}{70 - \beta_{cg}}\right] F_D \qquad \text{kN/m}^2$$

(ii) Bottom Slamming Pressure for Craft Less Than 61 meters, The design pressure may be:

$$P_{bxx} = \frac{N_1 \Delta}{L_w B_w}\left[1 + n_{cg}\right] F_D F_V \qquad \text{kN/m}^2$$

(iii) Hydrostatic Pressure

$$P_d = N_3(0.64\mathrm{H} + \mathrm{d}) \qquad \text{kN/m}^2$$

where:

P_{bcg}	=	bottom design pressure at LCG	kN/m²
P_{bxx}	=	bottom design pressure at any section clear of LCG	kN/m²
P_d	=	bottom design pressure based on hydrostatic forces	kN/m²
n_{cg}	=	the vertical acceleration of the craft as determined by a model test, theoretical computation, or service experience (see 1.3 of this Part). If this information is not readily available during the early stages of design, the following formula utilizing the average 1/100 highest vertical accelerations at LCG can be used:	

$$n_{cg} = N_2\left[\frac{12 h_{\frac{1}{3}}}{B_w} + 1.0\right]\tau\left[50 - \beta_{cg}\right]\frac{V^2 (B_w)^2}{\Delta} \qquad \text{g's}$$

note that g's are the dimensionless ratio of the acceleration at sea level (9.8m/s²)

The vertical acceleration, n_{cg}, is typically not to be taken greater than the following:

$$n_{cg} = 1.39 + 0.256\frac{V}{\sqrt{L}} \quad \text{g's}$$

for speeds greater than $18\sqrt{L}$, the maximum n_{cg} is 6.0 g (7.0 g for search and rescue type craft)

The vertical accelerations are typically not to be taken less than 1.0 g for craft lengths less than 24 m and 2.0 g for craft lengths less than 12 m. Intermediate values can be determined by interpolation. The vertical acceleration will need to be specially considered for craft fitted with seat belts or special shock mitigation seats

In addition to the above, the n_{cg} is to comply with 2.2.7 of this Chapter.

n_{xx} = average of the 1/100 highest vertical accelerations, at any section clear of LCG can be determined by the following equation:

= $n_{cg}K_V$ g's

N_1 = 0.1

N_2 = 0.0078

N_3 = 9.8

Δ = displacement at design waterline kg

L_w = craft length on the waterline with the craft at the design displacement and in the displacement mode m

B_w = maximum waterline beam m

H = wave parameter, 0.0172L + 3.653, generally not to be taken less than the maximum survival wave height for the craft m

$h_{1/3}$ = significant wave height, see Table III 2-3 of this Chapter m

τ = running trim at V, in degrees, but generally not to be taken less than 4° for craft L < 50 m, nor less than 3° for L > 50 m. Special consideration will be given to, designers' values predicted from model tests. °

β_{cg} = deadrise at LCG, in degrees, generally not to be taken less than 10° nor more than 30° °

β_{bx} = deadrise at any section clear of LCG, in degrees, not to be taken less than 10° nor greater than 30°, see Fig. III 2-5 of this Chapter °

V = craft design speed in knots, see Table III 2-3 of this Chapter knot

F_D = design area factor given in Fig. III 2-7 of this Chapter for given values of A_D and A_R

Generally not to be taken less than 0.4. See Table III 2-4 of this Chapter for minimum values of F_D for craft less than 24 m in length

F_V = vertical acceleration distribution factor given in Fig. III 2-9 of this Chapter

K_V = vertical acceleration distribution factor given in Fig. III 2-8 of this Chapter

A_D = design area. For plating it is the actual area of the shell plate panel but not to be taken as more than $2.5s^2$. For longitudinals, stiffeners, transverses and girders it is the shell area supported by the longitudinal stiffener, transverse or girder; for transverses and girders the area used need not be taken less than $0.33l^2$. cm^2

A_R = reference area, $6.95\Delta/d$ cm^2

s = spacing of longitudinals or stiffeners cm

l = unsupported span of internals, see 2.4.1.(b)(i) of this Chapter cm

d = stationary draft. Vertical measured from baseline to design waterline at middle of design waterline length, but generally not to be taken as less than 0.04L. m

Table III 2-3
Design Significant Wave Heights, $h_{1/3}$, and Speeds, V

	Operational Condition	
	$h_{1/3}$	V
High-Speed Craft	4m (1)	V_m (2)
Coastal Craft	2.5m	V_m (2)
Riverine Craft	0.5m	V_m (2)

Notes:

(1) The design significant wave height for unrestricted service craft is greater than or equal to 4.0 m, generally not to be taken as less than L/12.

(2) V_m = maximum speed for the craft in the design condition specified in 2.2.1 of this Chapter.

Table III 2-4
Minimum Values for F_D (L ≤ 24m)

s mm	F_D
250	0.85
500	0.75
750	0.60
1000	0.50
1250	0.40

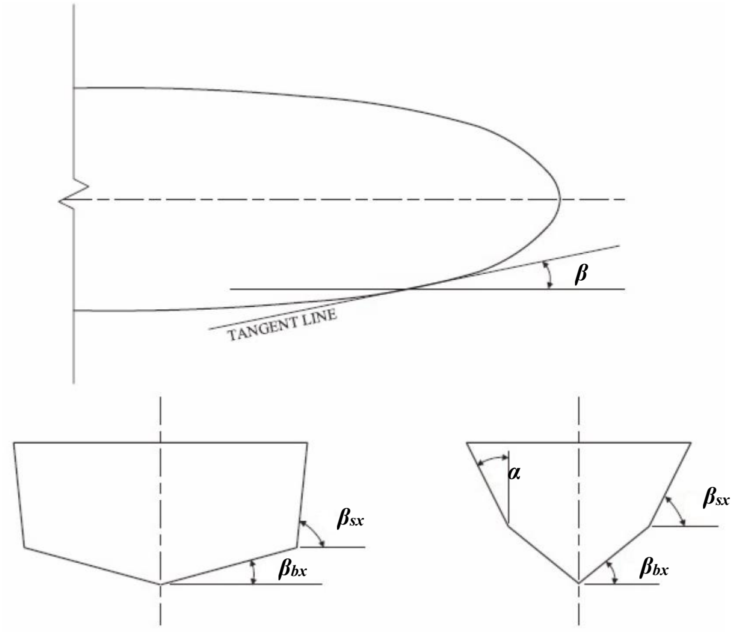


Fig. III 2-5
Deadrise, Flare, and Entry Angles

2.2.7 Vertical acceleration at LCG

(a) The design vertical acceleration at LCG, n_{cg}, is defined by the designer and corresponds to the average of the 1/100 highest accelerations in the most severe sea conditions expected, in addition to the gravity acceleration. Generally, it is to be not less than:

$$n_{cg} = Tsc \cdot Sac \cdot \frac{V}{\sqrt{L}} \qquad g's$$

where:

Tsc = 1.333

Sac = In general, Sac for significant wave heights (Hs) ≥ 4.0 m should not be lower than:

$$0.2 + \frac{0.6}{V/\sqrt{L}}$$, but not less than 0.32.

Note: Other than above Tsc and Sac are subject to special consideration by the Society.

(b) Lower n_{cg} values may be accepted at the Society's discretion, if justified, on the basis of model tests and full-scale measurements.

(c) An acceleration greater than $n_{cg} = 1.5 \cdot Tsc$ may not be adopted for the purpose of defining limit operating conditions.

2.2.8 Assessment of limit operating conditions

(a) General

(i) It is the designer's responsibility to specify the format and the values of the limit operating conditions. Their format may be for example a relation between speed and significant wave height which ascertains actual loads less than the one used for structural design. They must include the maximum allowed significant wave height H_{sm} consistent with the structural strength. H_{sm} is not to be greater than the value calculated according to 2.2.8(a)(ii) below.

(ii) It is assumed that, on the basis of weather forecast, the craft does not encounter, within the time interval required for the voyage, sea states with significant heights, in m, greater than the following:

$$H_{sm} = 5 \cdot \frac{n_{cg}}{V/\sqrt{L}} \cdot \frac{L}{6 + 0.14 \cdot L}$$

where vertical acceleration n_{cg} is defined in 2.2.1(a) of this Chapter.

2.4 Framing

<u>*Paragraph 2.4.2(c)(ii) has been amended as follows:*</u>

2.4.2 Fiber Reinforced Plastic

(c) Strength and Stiffness

(i) Section Modulus

The section modulus of each longitudinal, stiffener, transverse web and girder including the plating to which it is attached is to be not less than given by the following equation:

$$\mathrm{SM} = \frac{83.3 \times psl^2}{\sigma_a} \qquad \mathrm{cm}^3$$

where p, s, *l* and σ_a are defined in 2.4.1(b) of this Chapter.

Where the shell, deck or bulkhead plating, and the webs and flange and crown of the member are of different strength or elastic property plies, consideration is to be given to the effect of the different moduli plies in calculating the moment of inertia and section modulus; the required section modulus is to be considered for each different strength laminate of the member.

(ii) Moment of Inertia

The moment of inertia of each longitudinal, stiffener, transverse web, stringer or girder, including the plating to which it is attached, is to be not less than given by the following equation:

$$I = \frac{260psl^3}{K_4 E} \qquad \mathrm{cm}^4$$

where:

K_4	=	0.005	for shell and deep tank girders, stringers and transverse webs.
	=	0.004	for deck girders and transverses.
	=	0.010	for all other members.
E	=	tensile or compressive modulus representative of the basic value used in the moment of inertia calculation N/mm^2	

p, s and *l* are as given in 2.4.1(b) of this Chapter.

<u>*Paragraphs 2.4.3(f) & (g) have been added and renumbered as follows:*</u>

2.4.3 Stanchions

(a) General

The structure under stanchions is to be of sufficient strength to distribute the loads effectively. Stanchions between each tier of decks shall be alligned to each other as far as practicable; where this is not practicable, effective means are to be provided for transmitting the loads to the structure below. Stanchions in double bottoms and under the tops of deep tanks are to be metal and solid in cross section. Stanchions are in general not to be used in the bottom or double bottom structures where subject to high impact loads in service.

(b) Stanchion Analysis

The load, W, on a given stanchion is to be developed from the end reaction from the girders that the stanchion supports. These end reactions are to be developed considering the design pressure for the deck in which they are located plus any point loads from stanchions located on the girder. When cascading the stanchion loads through the structure, the analysis is to consider the load from the deck directly above the stanchion plus the loads from all complete decks and one-half the load from all partial or deckhouse decks. The requirement in 2.4.3(c) of this Chapter is given for a simple stanchion that will only need to support the deck directly above. In general, stanchions are to have sectional area not less than 1.015W cm^2 where the stanchions are subject to tension loads.

(c) Stanchion Load

The load on a stanchion is to be obtained from the following equation:

$$W = pbs \qquad \text{kN}$$

where:

W	=	load	kN
b	=	mean breadth, of area supported	m
s	=	mean length, of area supported	m
p	=	design pressure, as given in 2.2 of this Chapter	kN/m^2

(d) Permissible Load

The load a stanchion may carry is to be equal to or greater than the load on the stanchion obtained in 2.4.3(b) of this Chapter. This permissible load is to be obtained from the following equations:

(i) Steel Stanchions

$$W_a = (k - nl/r)A \qquad \text{kN}$$

(ii) Aluminum-Alloy Stanchions

$$W_a = (10.00 - 5.82l/r)A\sigma_y/165 \qquad \text{kN}$$

where:

W_a	=	permissible load	kN
k	=	12.09 ordinary strength steel	
	=	16.11 HT32 strength steel	
	=	18.12 HT36 strength steel	
n	=	4.44 ordinary strength steel	
	=	7.47 HT32 strength steel	
	=	9.00 HT36 strength steel	
r	=	least radius of gyration of stanchion	cm
A	=	area of stanchion	cm^2
l	=	unsupported length of stanchion	m
σ_y	=	minimum yield strength of welded aluminum under consideration	N/mm^2

The adoption of aluminum test values higher than given in Part II, Chapter 2 will be subject to special consideration.

(e) FRP Stanchions

FRP stanchions will be subject to special consideration.

(f) Stainless Steel or Stainless Clad Steel Stanchions

Where stainless steel or stainless clad steel specified in Chapter 9 of Part XI of the Rules for Steel Ships is used for the main hull structure, use of the materials and their scantlings are to be subject to the following:

(i) The section modulus of the transverse section of the hull is not to be less than the value obtained by multiplying the following material factor (K) with the value specified in Chapter 3 of Part XV of the Rules for Steel Ships. However, the material factor (K) is to be rounded to three decimal places and not less than 0.63.

$K = f_T \{8.81(\sigma_y/1000)^2 - 7.56(\sigma_y/1000) + 2.29\}$ for $\sigma_y \leq 355$ (N/mm^2)

$K = f_T f_C (235/\sigma_y)$ for stainless steel with $\sigma_y > 355$ (N/mm^2)

where

f_C = $3.04(\sigma_y/1000)^2 - 1.09(\sigma_y/1000) + 1.09$

where:

σy = The minimum value of yield strength (N/mm^2) or proof stress (N/mm^2) of stainless steel or stainless clad steel specified in Chapter 3 of Part XI of the Rules for Steel Ships

f_T = $0.0025(T-60)+1.00$

where:

T = The maximum temperature (°C) of cargo in contact with the materials. Where the temperature is less than 60°C, T is to be taken as 60°C. However, if T is more than 100°C, the value is at the discretion of the Society.

(~~f~~g) Support by Bulkheads

Bulkheads supporting girders or bulkheads fitted in lieu of stanchions are to be stiffened to provide support not less effective than required for stanchions.

2.5 Hull Structural Arrangement

Paragraph 2.5.1(b)(i) has been amended as follows:

2.5.1 Structural Arrangement – All Materials

(b) Watertight Bulkheads

(i) General

All vessels having lengths, L, equal to or exceeding 15 m ~~(50 ft)~~ are to be provided with watertight bulkheads in accordance with this section. The plans submitted are to clearly show the location and extent of each watertight bulkhead.

Paragraph 2.5.3(a) has been amended as follows:

2.5.3 Structural Arrangements – Additional Requirements for Fiber Reinforced Plastic Hull

(a) Tanks

In fiber reinforced plastic construction, non-integral tanks are to be used whenever possible. When integral tanks are used they are to be of single skin construction; the only exception is the tank top plating can be of sandwich construction. No stiffeners within integral tanks are to penetrate the tank boundaries. No gasoline tanks, or tanks containing petroleum products with flash points less than ~~61~~60°C are to be fitted integrally. The design and arrangements of oil fuel tanks is to be such that there is no exposed horizontal surface at the bottom that could be exposed to a fire. Other fire protection arrangements for oil fuel tanks will be specially considered. For details of fire protection requirements see 4.1 of this Part.

All internal surfaces of FRP tanks are to be covered with chopped strand mat weighing at least 600 g/m^2. This covering is to be in addition to the scantlings required by the Rules. A suitable coating is to be applied to this covering to prevent the contents of the tank from impregnating the surrounding laminates. The sides, tops, and baffles of integral tanks are to have all connections taped on both sides. Fresh water tanks are to be coated with a non-toxic and non-tainting coat of resin that is recommended by the resin manufacturer for potable water tanks. Where outfit items are to be laminated to the tank surface, the heavy coating of resin is to be applied afterwards and the laminated brackets sealed to prevent the ingress of moisture. The scantlings of integral oil fuel and water tanks are to be in accordance with 2.3 and 2.4 of this Chapter. Integral tanks are to be tested in accordance with Table III 7-1 of this Chapter

2.7 Keels, Stems, Shaft Struts, and Propeller Nozzles

Paragraph 2.7.6(b) has been amended as follows:

2.7.6 Skegs and Other Hull Appendages

Craft fitted with skegs and other permanent hull appendages are to comply with the following:

(a) The anticipated operational loadings under all craft operations (docking loads, hydrodynamic forces, and etc., as applicable) are to be submitted for CR review.

(b) All skegs and other permanent hull appendages are to be attached to the shell plate by means of double continuous fillet welds in accordance with 2.5.3 of Part II of the Rules for HSC using a weld factor C = 0.5 DC. Appendage structure is to be aligned or reinforced with internal hull structural members.

….

(f) Where the appendages designed to shear off in the event of impact, calculations for the appendage are to be submitted and subject to special consideration.

2.11 Bulwarks, Rails, Ports, Portlights, Windows, Ventilators, Tank Vents and Overflows

Paragraph 2.11.1(b) has been amended as follows:

2.11.1 Bulwarks and Guard Rails

Bulwarks or guard rails or a combination of both, are in general to be provided on periphery of exposed decks, and on exposed tops of superstructures and deckhouses.

Where the flag administration has specific requirements for bulwarks and guardrails they may be accepted provided they are not less effective.

For vessels less than 24 meters in length, may be special considered.

(b) Strength of Bulwarks

(i) Bulwarks are to be of ample strength for their height and location, suitably stiffened at the top, and if necessary at the bottom, and supported by efficient stays or brackets.
Stays or brackets on the main weather deck are to be spaced not more than 1.83 m.
Openings in bulwarks are to be smooth-edged, with well-rounded corners.

(ii) The thickness of bulwark plates shall not be less than required for side plating in a superstructure in the same position.

(iii) A strong bulb section or similar shall be continuously welded to the upper edge of the bulwark. Bulwark stays shall be in line with transverse beams or local transverse stiffening. The stays shall have sufficient width at deck level. The deck beam shall be continuously welded to the deck in way of the stay. Bulwarks on forecastle decks shall have stays fitted at every frame.

Stays of increased strength shall be fitted at ends of bulwark openings. Openings in bulwarks should not be situated near the ends of superstructures.

(iv) Where bulwarks on exposed decks form wells, ample provision shall be made to freeing the decks for water.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF COAST GUARD SHIPS 2025"

PART IV MACHINERY AND SYSTEMS

List of major changes in Part IV from 2025 edition

4.1.2(a)	Revised
4.1.2(b)(i)	Revised
4.1.2(b)(ii)	Revised
4.1.2(b)(iii)	Revised

Rules for the Construction and Classification of Coast Guard Ships 2025 have been partly amended as follows:

Chapter 4
Electrical Installation

Paragraph 4.1.2(a) has been amended as follows:

4.1 General

4.1.2 Drawings and Data

(a) The builder or manufacturer is to submit the following drawings and data for approval before the work commences:

(i) For propulsion machineries, generators and essential motors of 375 kW and over: Complete rating, seating arrangements, assembly, shaft, stator and rotor details, electric propulsion coupling details, mass, main dimensions, main materials used, and data for calculation of critical speed.

(ii) For generators below 375 kW: Complete rating, seating arrangements, type of enclosure and dimensional outline.

(iii) For essential motors ~~over 15 kW~~ of 75 kW and above but below 375 kW: Complete rating, seating arrangements, type of enclosure and dimensional outline.

(iv) For switchboards: Arrangements and details, front view, installation arrangements and wiring diagram.

(v) For wiring: All wiring plans and circuit diagrams including load distribution, wire size, type of cable, maximum temperature rise of conductor and voltage drop, type of insulation, rating or setting of circuit breaker, rating of fuse and switch, and interrupting capacity of circuit breaker and fuse.

(vi) For arrangement: General arrangement of electric equipment including details of the main cable runs.

(vii) For electric propulsion system, including the following:

(1) One-line diagrams of propulsion control system for power supply, circuit protection, alarm, monitoring, safety and emergency shutdown systems including list of alarm and monitoring points.

(2) Plans showing the location of propulsion controls and its monitoring stations.

(3) Arrangements and details of the propulsion control console or panel including schematic diagram of the system therein.

(4) Arrangements and details of the semiconductor converter enclosure for propulsion system, including data for semiconductor converter, cooling system with its interlocking arrangement.

(5) Harmonic distortion calculation.

Paragraph 4.1.2(b)(i) has been amended as follows:

(b) The builder is to submit the following specification and data for approval before the work commences:

(i) Load analysis and protective device coordination study.

(1) ~~A protective device coordination study is to be submitted for review. This protective device coordination study is to consist of an organized time-current study of all of the protective devices in series from the utilization equipment to the source for all circuit protection devices having different setting or time-current characteristics for long-time delay tripping, short-time delay tripping and instantaneous tripping, where applicable. Where an over-current relay is provided in series and adjacent to the circuit protection device, the operating and time-current characteristics of the relay are to be considered for coordination.~~
This protective device coordination study is to be an organized time-current study of all protective devices, taken in series, from the utilization equipment to the source, under various conditions of short circuit. The time-current study is to indicate settings of long-time delay tripping, short-time delay tripping, and instantaneous tripping, as applicable. Where an overcurrent relay is provided in series and adjacent to the circuit protective devices, the operating and time-current characteristics of the relay are to be considered for coordination. Typical thermal withstanding capacity curves of the generators are to be included, as appropriate.

(2) ~~The~~An electric-plant load analysis is to cover all operating conditions of the ship ~~craft~~, such as conditions in normal sea going, cargo handling ~~(loading/unloading)~~, harbor maneuver ~~in/out~~, emergency, and dynamic positioning operations.

Paragraph 4.1.2(b)(ii) has been amended as follows:

(ii) Calculations of short circuit currents at main, emergency and sub-switchboards including those fed from transformers.

(1) ~~In order to establish that the protective devices on the main and emergency switchboards have sufficient short-circuit breaking and making capacities, data are to be submitted giving the maximum calculated short-circuit current in symmetrical rms and asymmetrical peak values available at the main bus bars together with the maximum allowable breaking and making capacities of the protective device. Similar calculations are to be made at other points in the distribution system, where necessary, to determine the adequacy of the interrupting capacities of the protective devices.~~
Maximum calculated short circuit current values, both symmetrical and asymmetrical values, available at the main and emergency switchboards and the downstream distribution boards.

(2) Rated breaking and making capacities of the protective devices.

Paragraph 4.1.2(b)(iii) has been amended as follows:

~~(iii) Explanation of electric propulsion system~~

(~~iv~~iii) Maintenance schedule of batteries

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