財團法人驗船中心
CR CLASSIFICATION SOCIETY

RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF HIGH-SPEED CRAFT 2023

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
III	1 January, 2026
IV	1 January, 2026

The Rules for the Construction and Classification of HIGH-SPEED CRAFT 2023 and this Amendment are to be consolidated and published as *January 2026 Edition*.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF HIGH-SPEED CRAFT 2023"

PART I CLASSIFICATION AND SURVEY

List of major changes in Part I from 2023 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 1-7	Revised
Table I 1-8	Revised
Table I 1-9	Revised
2.2.1(d)	Revised
2.3.5	Revised
2.5.1	Revised
2.7.1(c)	Revised
2.9.1	Revised
A1.2.1(c) & A1.2.3(a)	Revised

Rules for the Construction and Classification of High-Speed Craft 2023 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.

Paragraphs 1.15.1(j) & (k) have been amended and renumbered 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), ~~fixed fire detection and fire alarm systems~~ the general emergency alarm system and the public address system (refer to 7.2 of the LSA Code).

(k) Noise measurements. (~~If applicable,~~ refer to Part II Chapter 34 of the Rules of Steel Ships)

(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 Ship Type Notation

Notation	Description	Reference
Passenger Ship	For ship which carry more than 12 passengers.	The Rules
IP	This notation will be assigned to cargo ships and highspeed cargo craft of 500 GT and upwards which carry more than 12 industrial personnel that comply with the IMO Resolution MSC.521(106) containing the new SOLAS Chapter XV and International Code of Safety for Ships Carrying Industrial Personnel (IP Code).	IMO Resolution MSC.521(106) and IP Code

Note:

(1) For craft deemed necessary by the Society, an appropriate notation except specified above may be affixed to classification character.

Table I 1-7 has been amended as follows:

Table I 1-7
List of Additional Survey Notation

Notation	Description	Reference
IWS	This notation (**I**n **W**ater **S**urvey) may be assigned to craft which are provided with suitable arrangements to facilitate the In-Water Surveys.	Part I/1.6.7(b) & 2.2.2 of the Rules
PCM-OL[(1)]	This notation (**P**ropeller shaft **C**ondition **M**onitoring – **O**il **L**ubricated) will be assigned when oil lubricated propeller shaft arrangements with approved oil glands are fitted and the requirements of 2.3.~~4~~5 of Part I of the Rules are complied with.	Part I/2.3.~~4~~5 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-lubricated propeller shaft arrangements are fitted and the requirements of 2.3.5 of Part I of the Rules are complied with.	Part I/2.3.5 of the Rules
PMS[(1)]	This notation (**P**lanned **M**aintenance **S**cheme for machinery) will be assigned to craft 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 1-8 has been amended as follows:

Table I 1-8
List of Special Equipment Notation

Notation	Description	Reference
Helideck-N	This notation (**Heli**copter **deck**), with N being **I**, **II, III** or **IV**, will be assigned to craft provided with helicopter facilities in accordance with related requirements of the Rules for Steel Ships.	Part II Chapter 12A of the Rules for Steel Ships
HHA	This notation (**H**igh **H**olding **A**nchor) will be assigned to craft receiving the equipment symbol **E,** with a specially considered and approved anchor that have at least 2 times the holding power of ordinary stockless anchors of the same weight. The mass of each bower anchor can be reduced up to 25% of the mass specified in Part III 5.1.4(a), (see Table III 5-1.), of the Rules.	Part III/ 5.1.4(a) of the Rules and Part XI Chapter 12 of the Rules for Steel Ships
SHHA	This notation (**Super H**igh **H**olding **A**nchor) will be assigned to craft receiving the equipment symbol **E,** with a specially considered and approved anchor that have at least 4 times the holding power of ordinary stockless anchors of the same weight. The mass of each bower anchor can be reduced by up to 50% of the mass specified in Part III 5.1.4(a), (see Table III 5-1), of the Rules.	Part III/ 5.1.4(a) of the Rules and Part XI Chapter 12 of the Rules for Steel Ships
Cyber-R	This notation (**Cyber-R)** will be assigned to craft where the applicable requirements in 3.2.12(c)(i) of Part VIII are complied with.	Part VIII/ 3.2.12(c)(i) of the Rules for Steel Ships
Cyber-SnE	This notation (**Cyber-SnE)** will be assigned to craft where the applicable requirements in 3.2.12(c)(ii) of Part VIII are complied with.	Part VIII/ 3.2.12(c)(ii) of the Rules for Steel Ships

Table I 1-9 has been amended as follows:

Table I 1-9
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 craft 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 craft 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 craft 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 craft when the requirements of Navigation Safety System in Chapters 1 through 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 craft 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.

….

(g) Special consideration may be given in application of relevant requirements of this section to commercial ships owned or chartered by Governments, which are utilized in support of military operations or service.

Paragraph 2.3.5 has been amended as follows:

2.3 Surveys of Propeller Shafts and Tube Shafts

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

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-OL** or **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-OL** or **PCM-OLW** is applicable for a ship with oil-lubricated propeller shaft or open loop water-lubricated propeller shaft, provided the applicable requirements specified below are complied with.

(a) Oil lubricated shaft (**PCM-OL**)

Where oil lubricated shaft with approved oil glands are fitted, a class notation **PCM-OL** may be assigned, if its relevant drawing(s) and data ~~monitoring manuals or maintenance manuals of preventive maintenance system together with relative diagrams,~~ are submitted and approved by the Society. The management systems are to comply with the following:

(i) Lubricating oil analysis is to be carried out regularly at intervals not exceeding 6 months. The lubricating oil analysis documentation is to be available on board. Each analysis is to include the following minimum parameters:

(1) Water content;

(2) Chloride content;

(3) Bearing material and metal particles content; and

(4) Oil ageing (resistance to oxidation).
Oil samples are to be taken under service conditions and representative of the oil within the stern-tube.

(ii) Oil consumption is to be recorded monthly.

(iii) Bearing temperatures are to be recorded daily, (2 temperature sensors with alarm or other approved arrangements are to be provided).

(iv) Facilities are to be provided for measurement of bearing wear down.

(v) Oil glands are to be capable of being replaced without withdrawal of the propeller shaft or removal of the propeller.

(b) 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 2.3.3 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 2.3.5(b)(iii)(2) & (4) of this Chapter
Lubricant pressure	Low		X(2)	Refer to 2.3.5(b)(iii)(2) & (4) of this Chapter
Lubricant temperature at stern tube inlet	High		X(2)	Refer to 2.3.5(b)(iii)(4) of this Chapter
Aft bearing wear down			X(2)	Refer to 2.3.5(b)(ii)(4) of this Chapter

Notes:

(1) Automatic start of standby pump.

(2) Indicating the values.

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

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

Satisfactory operating conditions of the propeller shaft are to be confirmed, including the verification of the records of lubricating oil analysis, lubricating oil consumption, bearing temperatures and wear down readings.

(ii) 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 lnlet
- 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 2.3.5(b)(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~~d) Where the notation **PCM-OL** or **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~~e) For craft with **PCM-OL** or **PCM-OLW** notation, the ~~propeller~~ maximum propeller shaft survey interval required by 2.3.2 ~~(c) or (d)~~ and 2.3.3 of this Part shall not exceed ~~will be extended up to~~ 15 years provided:

(i) Annual Surveys are carried out to the satisfaction of the attending Surveyors, and

(ii) The followings are carried out at each propeller shaft survey due date required by 2.3.2(c) or (d).

(1) Bearing wear down measurement.

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

(3) Verification of effective inboard and outboard seals.

(4) Renewal of outboard seal in accordance with manufacturer's recommendation.

~~(5) For keyed propellers, the fore part of the shaft taper and shaft keyway are to be examined by an appropriate surface crack detection method(such as magnetic particle or dye penetration), for which dismantling of the propeller and removal of the key will be required.~~

(~~e~~f) Initial survey for existing ships obtaining **PCM-OL** or **PCM-OLW** notation

(i) All systems required by 2.3.5(a) or 2.3.5(b) of this Part are to be examined and tested in accordance with the approval plans, and

(ii) Propeller shaft survey as per ~~2.3~~ 2.3.2 or 2.3.3 of this Part ~~will~~ is to be required including drawing the shaft and examining the entire shaft ~~if the last propeller shaft survey was carried out more than 5 years prior to the initial survey~~, or

(iii) For **PCM-OL** notation

If the last propeller shaft survey was carried out not more than 5 years prior to the initial survey, ~~T~~the propeller shaft survey may be waived subject to satisfactory review of the following records:

(1) Six-monthly records of stern bearing oil analysis for water and metal contents, covering the last 5 years.

(2) Monthly records of stern bearing oil consumption, covering the last 5 years.

(3) Monthly records of stern bearing temperature monitoring, covering the last 5 years.

(4) Propeller shaft, stern bearing assembly and propeller operation and repair records, if available.

(5) Records of stern bearing clearance and weardown measurement from new building and last dry docking.

Paragraph 2.5.1 has been amended as follows:

2.5 Annual Surveys

2.5.1 Annual surveys - hull

At each Annual Survey the weather decks, hull plating and their closing appliances together with watertight penetrations are to be generally examined as far as practicable~~, 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:~~ The survey is to include the following:

(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. Exposed hatch covers are to be examined to confirm the structural integrity and capability of maintaining weathertightness. Where extensive areas of wastage of steel hatch covers are found, thickness measurements are to be carried out, and renewals or repairs made where wastage exceeds allowable margins. Where substantial corrosion is found, additional thickness measurements are to be taken to confirm the extent of substantial corrosion.

(ii) Where mechanically operated steel covers are fitted, ~~checking the satisfactory condition, as applicable,~~ examination of:

(1) Hatch covers; including plating and stiffeners;

(2) Tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels, drains, and non return valves, if fitted);

(3) Steel-to-steel contact between cover and coaming, support pads, cleats (including cross joint bolts and/or wedges)

(~~3~~4) Clamping devices, retaining bars, cleating;

(~~4~~5) Chain or rope pulleys;

(~~5~~6) Guides;

(~~6~~7) Guide rails and track wheels;

(~~7~~8) Stoppers, etc;

(~~8~~9) Wires, chains, gypsies, tensioning devices;

(~~9~~10) Hydraulic system essential to close and securing;

(~~10~~11) Safety locks and retaining devices.

(iii) Where ~~portable~~ wooden covers on portable beams~~, wooden~~ or steel pontoons covers are fitted, ~~checking the satisfactory condition, where applicable,~~ examination of:

(1) Wooden covers and portable beams, carriers or sockets for the portable beam, and their securing devices;

(2) Steel pontoons;

(3) Tarpaulins;

(4) Cleats, battens and~~,~~ wedges;

…

(8) Compression bars, drainage channels and drain pipes (if any).

(iv) Checking the satisfactory condition of hatch coaming plating and their stiffeners, ~~including close-up survey~~ where applicable.

…

(vi) Examination of the weld connection between air pipes / sounding pipes and deck plating.

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

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

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

(b) Suspect Areas and Examination of Ballast Tanks

…

(c) Protection of other openings

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

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

…

(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) Craft 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 be 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 are to be surveyed as per Special Survey, see IACS UR Z24-3.

Paragraph 2.9.1 has been amended as follows:

2.9 Hull Surveys of High-Speed Craft

2.9.1 Annual Survey

(a) For craft 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 craft 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 craft 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.

….

(c) For craft subject to the 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.

Appendix 1
Loading Computer System (LCS) for Stability and Longitudinal Strength

Paragraphs A1.2.1(c) & A1.2.3(a) have been amended as follows:

A1.2 Approval and Testing Requirements

A1.2.1 Approval principles

(a) The requirements of hardware is to be complied with the Rules.

(b) The software can be either type approved or case-by-case approved. The latter case is only in condition with system installation on board a specific ship. In either case, relevant requirements stated in section A1.1 are to be complied with.

(c) Approval and certification.

(i) Documentation according to A1.1.4 including preliminary test conditions in accordance with A1.2.2 is to be submitted for approval.

(ii) Final test conditions according to A1.2.2, are to be tested on board in the presence of the Surveyor as described in A1.2.3.

(iii) Report ~~Certificate~~ of the loading computer system will be issued after checking of final test conditions on board.

A1.2.2 Test conditions

….

A1.2.3 Testing and certification

(a) General

(i) At least 4 of the final test conditions are to be tested on board in the presence of the Surveyor, before the report of the loading computer system ~~certificate~~ is issued.

(ii) The results from the test conditions must not deviate significantly from the results in the approved loading manual or stability booklet. If found unacceptable, the reason for the deviation is to be clarified.

(iii) A copy of the final test conditions endorsed by a Surveyor is to be kept on board.

(iv) If the final loading manual or the final stability booklet has not been approved before delivery, testing on board may take place after these documents have been approved.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF HIGH-SPEED CRAFT 2023"

PART III HULL CONSTRUCTION AND EQUIPMENT FOR HIGH-SPEED CRAFT

List of major changes in Part III from 2023 edition

1.1.28	New
2.2.1(a) & 2.2.7~2.2.8	Revised and New
2.4.3(f) & (g)	New and Renumbered

Rules for the Construction and Classification of High-Speed Craft 2023 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/m^2

P_{bxx} = bottom design pressure at any section clear of LCG kN/m^2

P_d = bottom design pressure based on hydrostatic forces kN/m^2

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:

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

note that g's are the dimensionless ratio of the acceleration at sea level (9.8m/s^2)
The vertical acceleration, n_{cg}, is typically not to be taken greater than the following:

$$n_{cg} = 1.39 + 0.256\frac{V}{\sqrt{L}}$$ 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

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:

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

where:

Tsc = 0.666 for Passenger, Ferry, Cargo
= 1 for Supply
= 1.333 for Pilot, Patrol
= 1.666 for Rescue

Sac = C_F [(1)] for Open sea
= 0.3 for Restricted open sea
= 0.23 for Moderate environment[(2)]
= 0.14 for Smooth sea[(3)]

Note:(1) For passenger, ferry and cargo craft, their seaworthiness in this condition is to be ascertained. In general, Sac should not be lower than the values given in this Table, where:

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

(2) Not applicable to craft with type of service "Rescue"

(3) Not applicable to craft with type of service "Pilot, Patrol" or "Rescue"

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.

(d) The sea areas are defined with reference to significant wave heights $h_{1/3}$ which are exceeded for an average of not more than 10% of the year:

(i) Open-sea service: $h_{1/3} \geq 4.0$ m

(ii) Restricted open-sea service: $2.5 \text{ m} \leq h_{1/3} < 4.0$ m

(iii) Moderate environment service: $0.5 \text{ m} < h_{1/3} < 2.5$ m

(iv) Smooth sea service: $h_{1/3} \leq 0.5$ m.

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.

Paragraphs 2.4.3(f) & (g) have been added and renumbered as follows:

2.4 Framing

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:

$$W = pbs \qquad kN$$

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

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

(ii) Aluminum-Alloy Stanchions

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

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/mm2) or proof stress (N/mm2) 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 (^{0}C) of cargo in contact with the materials. Where the temperature is less than 60 ^{0}C, T is to be taken as 60 ^{0}C.
However, if T is more than 100ºC, 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.

AMENDMENT TO "THE RULES FOR THE CONSTRUCTION AND CLASSIFICATION OF HIGH-SPEED CRAFT 2023"

PART IV MACHINERY AND SYSTEMS

List of major changes in Part IV from 2023 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 High-Speed Craft 2023 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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