Rules for the Classification of Charter Yachts

Effective from 1 January 2006

Part F

Additional Class Notations

RINA S.p.A.
Via Corsica, 12 - 16128 Genova - Italy
Tel. +39 01053851 - Fax: +39 0105351000
E-MAIL info@rina.org - WEB www.rina.org
C.F./P.Iva 03794120109
Cap. Soc. EURO 30.192.800,00 i.v.
R.I. Genova N. 03794120109

Editor:	Marcello Lucentini
Editorial office:	RINA S.p.A. Via Corsica, 12 - 16128 GENOVA Tel. +39 010 53851
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PREAMBLE TO THE RULES: GENERAL CONDITIONS

Definitions:

"*Rules*" means the Rules for the Classification of Yachts engaged in Commercial Use for Sport or Pleasure, that do not carry Cargo and do not carry more than 12 Passengers whether contained herein or in other documents issued by the Society.
"*Services*" means the activities described in article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.
"*Society*" means RINA S.p.A. and any other Company pertaining to the RINA Group which provides the Services.
"*Surveyor*" means technical staff acting on behalf of the Society in the performance of the Services.
"*Interested Party*" means a party, other than the Society, having responsibility for the classification of the yacht, such as the Owner of the yacht and his representatives, or the yacht builder, or the engine builder, or the supplier of parts to be tested.
"*Owner*" means the Registered Owner or the Disponent Owner or the Manager or any other party with the responsibility to keep the yacht seaworthy, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules.
"*Administration*" means the Government of the State whose flag the yacht is entitled to fly or the State under whose authority the yacht is operating in the specific case.

Article 1

1.1. - The purpose of the Society is, among others, the classification and certification of vessels, sea and river units, offshore structures and craft of all kinds and the certification of their parts and components.
The Society:
- sets forth and develops Rules, Guidance Notes and other documents;
- issues Certificates, Statements and Reports based on itssurvey activity.

1.2. – The Society also takes part in the implementation of National Regulations as well as International Rules and Standards, by delegation from different Governments.
1.3. – The Society carries out Technical Assistance on request and provides special services outside the scope of classification, which are regulated by these general conditions unless expressly derogated.

Article 2

2.1. - The Rules developed by the Society endeavor to meet the state of currently available technology at the time they are published. The Society is not responsible for any inadequacy or failure of these Rules or any other relevant documents as a result of future development of techniques, which could not have been reasonably foreseen at the time of their publication.
2.2. - The Society exercises due care and skill:
- in the selection of its Surveyors
- in the performance of its services, considering the state of currently available technology at the time the services are performed.

2.3. - Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the yacht or the good subject to certification. The Society may also commission laboratory testing, underwater inspection by divers and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society at its sole discretion based on its experience and knowledge and according to generally accepted technical standards in the industry.

Article 3

3.1. - The class assigned to a yacht reflects the opinion of the Society that the yacht, given the intended use and within the relevant time frame, complies with the Rules applicable at the time the service is rendered. Entry into force and application of new Rules are dealt with in Part A, Chapter 1, Section 1, Article 2 of the Rules.
3.2. - No report, statement, notation on a plan, review, Certificate of Classification or any document or information issued or given as part of the services provided by the Society shall have any legal effect or implication other than a representation that the yacht, structure, item of material, equipment or machinery or any other item covered by such document or information meets the Rules. Any such representation is issued solely for the use ofthe Society, its committees and clients or other duly authorized bodies and for no other purpose.
The validity, application, meaning and interpretation of a Certificate of Classification, or any similar document or information issued by the Societyin connection with or in furtherance of the performance of its services, is governed by the Rules of the Society, which is the sole subject entitled to their interpretation.
Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society , which will settle any divergence of opinion or dispute.
3.3. - The classification of a yacht, or the issuance of a certificate in relation to or in furtherance of the classification of a yacht or the performance of services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate and in no case shall amount to a representation, statement or warranty of seaworthiness, structural integrity, quality or fitness for a particular purpose or service of any yacht, structure, material, equipment or machinery surveyed by the Society.
3.4. - Any document issued by the Society in relation to its activities reflects the condition of the yacht at the time of the survey, with reference to the applicable Rules.
3.5. - The Rules, surveys performed, reports, certificates and other documents issued by RINA are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners or operators, underwriters, sellers or intended buyers of a yacht or other surveyed goods. They do not relieve such parties from any warranty or responsibility or other contractual obligations expressed or implied or from any liability whatsoever against third parties, nor do they confer on such other parties any right, claim or cause of action against the Society.
In particular, the above-mentioned activities of the Society do not relieve the Owner of his duty to ensure the proper maintenance of the yacht at all times.
In no case, therefore, the Society shall assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with inquiries concern-

ing matters not covered by its Rules or other documents.
Insofar as they are not provided for in the Preamble the duties and responsibilities of the Owner and Interested Parties with respect to the services rendered by RINA are outlined in Part A, Chapter 1, Section 1, Article 3.

Article 4

4.1. – Any request for any service of the Society shall be submitted in writing and signed by or on behalf of the Interested Party. Such request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including the Preamble.
Upon acceptance of the written request by the Society , a contract between the latter and the Interested Party is entered into, which is regulated by the present General Conditions.
4.2. - In consideration of the services rendered by the Society , the Interested Party and the person applying for the service shall jointly be liable for the payment of the relevant fees, even if the service is not concluded for any cause non pertaining to the Society, upon receipt of the invoice and shall reimburse the expenses incurred. Interests at the legal current rate increased by 2% may be demanded in the event of late payment.
4.3. - The contract and the validity of the relevant certificates, if any, may be terminated at the request of either party subject to 30 days' notice to be given in writing. Failure to pay the fees required for services carried out by the Society which fall within the scope of the above-mentioned contract will entitle the Society to terminate the contract and to suspend the Services.
Unless decided otherwise by the Society , termination of the contract implies that the assignment of class to a yacht is withheld or, if already assigned, that it is suspended or withdrawn.

Article 5

5.1. - In providing the services mentioned in Article 1 above, as well as other information or advice, neither the Society nor any of its servants or agents warrants the accuracy of any information or advice supplied. Furthermore, all express and implied warranties are specifically disclaimed.
Except as provided for in paragraph 5.2 below, and also in the case of surveys carried out by delegation of Governments, neither RINA nor any of its servants or agents will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, due to any act or omission of whatever nature, whether or not negligent, and howsoever caused.
5.2. – Notwithstanding the provisions in paragraph 5.1 above, should any user of RINA 's services prove that he has suffered a loss or damage due to any negligent act or omission of RINA, its servants or agents, then RINA will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fee - if any - charged by RINA for the specific service, information or advice or, if no fee is charged, a maximum of 10 thousand Euro.
Where the fees are related to a number of services, the amount of fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of each service. Any liability for indirect or consequential loss, damage or expenses is specifically excluded.
In any case, irrespective of the amount of the fees, the maximum damages payable by RINA will be not more than 1 million Euro. Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by RINA and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.
5.3. - Any claim for loss or damages of whatever nature by virtue of the provisions set forth herein shall be made in writing, and notice shall be provided to RINA within THREE MONTHS of the date on which the services were first supplied or the damages first discovered. Failure to provide such notice within the time set forth herein will constitute an absolute bar to the pursuit of such claim against RINA.

Article 6

6.1. - Any dispute arising from or in connection with the Rules or with the services of RINA, including any issues concerning responsibility, liability or limitations of liability, will be determined in accordance with Italian Law and proceedings will be instituted in or transferred to the Court of Genoa, Italy, which will have exclusive jurisdiction to hear and settle any such dispute.
6.2. - As partial departure from point 6.1 above, the Society shall have the faculty to submit any claim concerning the payment of the fees for the Services to the Jurisdiction of the Courts of the place where the registered office of the Interested Party or of the Applicant is located.

Article 7

7.1. - All plans, specifications, documents and information provided to, issued by, or made known to RINA, in connection with the performance of its services, will be treated as confidential and will not be made available to any other party without authorization of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, IACS Code of Ethics, Charter or other IACS rules, enforceable Court order or injunction.
Information about the classification and statutory certification status, including transfer, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed yachts and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.
7.2. - In the event of transfer of class or addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit RINA to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for the purpose of classification in compliance with IACS Procedure PR 1A, as amended, and applicable legislation. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.

Article 8

8.1. – Should any part of this Preamble be declared invalid, this will not affect the validity of the remaining provisions.

EXPLANATORY NOTE TO PART F

1. Reference edition

The reference edition of these Rules is the edition effective from 1 January 2006.

2. Effective date of the requirements

2.1 All requirements in which new or amended provisions with respect to those contained in the reference edition have been introduced are followed by a date shown in brackets.

The date shown in brackets is the effective date of entry into force of the requirements as amended by the last updating. The effective date of all those requirements not followed by any date shown in brackets is that of the reference edition.

2.2 Item 4 below provides a summary of the technical changes from the preceding edition. In general, this list does not include those items to which only editorial changes have been made not affecting the effective date of the requirements contained therein.

3. Rule subdivision and cross-references

3.1 Rule subdivision

The Rules are subdivided into six parts, from A to F.

Part A: Classification and Surveys

Part B: Hull

Part C: Machinery, Electrical Installations and Automation

Part D: Materials and Welding

Part E: Safety Rules

Part F: Additional Class Notations

Each Part consists of:

- Chapters
- Sections and possible Appendices
- Articles
- Sub-articles
- Requirements

Figures (abbr. Fig) and Tables (abbr. Tab) are numbered in ascending order within each Section or Appendix.

3.2 Cross-references

Examples: Pt A, Ch 3, Sec 1, [3.2.1] or Pt A, Ch 3, App 1, [3.2.1]

- Pt A means Part A

The part is indicated when it is different from the part in which the cross-reference appears. Otherwise, it is not indicated.

- Ch 3 means Chapter 3

The Chapter is indicated when it is different from the chapter in which the cross-reference appears. Otherwise, it is not indicated.

- Sec 1 means Section 1 (or App 1 means Appendix 1)

The Section (or Appendix) is indicated when it is different from the Section (or Appendix) in which the cross-reference appears. Otherwise, it is not indicated.

- [3.2.1] refers to requirement 1, within sub-article 2 of article 3.

Cross-references to an entire Part or Chapter are not abbreviated as indicated in the following examples:

- Part A for a cross-reference to Part A
- Part A, Chapter 1 for a cross-reference to Chapter 1 of Part A.

4. Summary of amendments introduced in the edition effective from 1 January 2006

This edition of the Rules for the Classification of Charter Yachts is considered as a "reference edition" for future amendments. It annuls and replaces the 2005 edition issued with Rule Variation DIP/2005/01 effective from 15 April 2005 which superseded the "Additional rules applicable to pleasure vessels for the assignment of the Class Notation CCL (Charter Class)".

RULES FOR THE CLASSIFICATION OF CHARTER YACHTS

Part F
Additional Class Notations

Chapter **1**

Chapter 1 ASSIGNEMENT OF ADDITIONAL CLASS NOTATIONS

CHAPTER 1
ASSIGNMENT OF ADDITIONAL CLASS NOTATIONS

Section 1 Unattended Machinery Spaces [AUT-UMS (Y)]

Section 2 Means to Prevent Sea and Air Pollution [GREEN_STAR (Y)]

Section 3 Comfort on board [COMF (Y)]

Section 4 Additional Safety Requirements (ASR)

Section 5 In-Water Survey Arrangements [Inwatersurvey (Y)]

Section 6 Shaft Monitoring [Mon-Shaft (Y)]

Appendix 1 Optional Requirements (Not Mandatory For the Assignment of the Green Star (Y) Additional Class Notation)

Part F
Additional Class Notations

Chapter 1
ASSIGNMENT OF ADDITIONAL CLASS NOTATIONS

SECTION 1 UNATTENDED MACHINERY SPACES [AUT-UMS (Y)]

1 General

1.1 Application

1.1.1 The additional class notation **AUT-UMS (Y)** [6.2.1] is assigned in accordance with Pt A, Ch 1, Sec 2, [6.4.2] to yachts fitted with automated installations enabling periodically unattended operation of machinery spaces, and complying with the requirements of this Section.

1.1.2 The arrangements provided shall be such as to ensure that the safety of the yacht in all sailing conditions, including manoeuvring, is equivalent to that of a yacht having the machinery spaces manned.

1.2 Exemptions

1.2.1 For yachts whose gross tonnage is less than 500 and propulsive power less than 1 MW, the requirements laid down in [4] do not apply. An alarm signal is to be activated in the following circumstances:

a) for diesel engine propulsion plant
- lubricating oil system low pressure
- cylinder coolant high temperature
- cylinder coolant low pressure or low flow rate
- cylinder coolant make up tank low level
- sea water cooling low pressure or low flow rate

b) for auxiliary internal combustion engines intended for electricity production of a power higher than 37 kW, supplying essential services:
- cylinder coolant high temperature
- lubricating oil system low pressure.

1.2.2 For yachts whose gross tonnage is less than 500 and propulsive power less than 1 MW, automatic stop is to be provided for lubricating oil failure of engines, reduction gears, clutches and reversing gears. A possible override of this automatic stop is to be available at the control stations, and an indication is to be provided at each control station, when override is activated.

1.3 Communication system

1.3.1 A reliable means of vocal communication shall be provided between the main machinery control room or the propulsion machinery control position as appropriate, the navigation bridge and the engineer officers' accommodation.

This means of communication is to be foreseen in collective or individual accommodation of engineer officers.

1.3.2 Means of communication are to be capable of being operated even in the event of failure of supply from the main source of electrical power.

2 Documentation

2.1 Documents to be submitted

2.1.1 In addition to those mentioned in Pt C, Ch 3, Sec 1, Tab 1, the documents in Tab 1 are required.

Table 1 : Documents to be submitted

No.	I/A **(1)**	Document
1	A	Means of communication diagram
2	A	Technical description of automatic engineer's alarm and connection of alarms to accommodation and bridge, when applicable
3	A	System of protection against flooding
4	A	Fire detection system: diagram, location and cabling
5	I	Automations test program

(1) A : to be submitted for approval
I : to be submitted for information.

3 Fire and flooding precautions

3.1 Fire prevention

3.1.1 Where fuel oil heating is necessary, it is to be arranged with automatic control. A high temperature alarm is to be fitted and the possibility of adjusting its threshold according to the fuel quality is to be provided. Such alarm may be omitted if it is demonstrated that the temperature in the tank cannot exceed the flashpoint under the following conditions: volume of liquid corresponding to the low level alarm and maximum continuous heating power during 24 hours.

3.2 Fire detection

3.2.1 For fire detection, the requirements given in Pt E, Ch 1 are applicable.

3.2.2 Means are to be provided to detect and give alarms at an early stage in case of fires:

- in boiler air supply casing and exhausts (uptakes); and
- in scavenging air belts of propulsion machinery

unless the RINA considers this to be unnecessary in a particular case.

3.2.3 An automatic fire detection system is to be fitted in machinery spaces of Category A as defined in Pt C, Ch 1, Sec 1, [1.3.1] intended to be unattended.

3.2.4 The fire detection system is to be designed with self-monitoring properties. Power or system failures are to initiate an audible alarm distinguishable from the fire alarm.

3.2.5 The fire detection indicating panel is to be located on the navigating bridge, fire control station, or other accessible place where a fire in the machinery space will not render it inoperative.

3.2.6 The fire detection indicating panel is to indicate the place of the detected fire in accordance with the arranged fire zones by means of a visual signal. Audible signals clearly distinguishable in character from any other signals are to be audible throughout the navigating bridge and the accommodation area of the personnel responsible for the operation of the machinery space.

3.2.7 Fire detectors are to be of such type and so located that they will rapidly detect the onset of fire in conditions normally present in the machinery space. Consideration is to be given to avoiding false alarms. The type and location of detectors are to be approved by RINA and a combination of detector types is recommended in order to enable the system to react to more than one type of fire symptom.

3.2.8 Except in spaces of restricted height and where their use is specially appropriate, detection systems using thermal detectors only are not permitted. Flame detectors may be installed, although they are to be considered as complementary and are not to replace the main installation.

3.2.9 Fire detector zones are to be arranged in a manner that will enable the operating staff to locate the seat of the fire. The arrangement and the number of loops and the location of detector heads are to be approved in each case. Air currents created by the machinery are not to render the detection system ineffective.

3.2.10 When fire detectors are provided with the means to adjust their sensitivity, necessary arrangements are to be allowed to fix and identify the set point.

3.2.11 When it is intended that a particular loop or detector is to be temporarily switched off, this state is to be clearly indicated. Reactivation of the loop or detector is to be performed automatically after a preset time.

3.2.12 The fire detection indicating panel is to be provided with facilities for functional testing.

3.2.13 The fire detecting system is to be fed automatically from an emergency source of power by a separate feeder if the main source of power fails.

3.2.14 Facilities are to be provided in the fire detecting system to manually release the fire alarm from the following places:

- passageways having entrances to engine and boiler rooms
- the navigating bridge
- the control station in the engine room.

3.3 Fire fighting

3.3.1 Unless otherwise stated, pressurisation of the fire main at a suitable pressure by starting a main fire pump and carrying out the other necessary operations is to be possible from the navigation bridge. Alternatively, the fire main system may be permanently under pressure.

3.4 Protection against flooding

3.4.1 Bilge wells or machinery spaces bilge levels are to be monitored in such a way that the accumulation of liquid is detected in normal angles of trim and heel.

3.4.2 Where the bilge pumps are capable of being started automatically, means shall be provided to indicate when the influx of liquid is greater than the pump capacity or when the pump is operating more frequently than would normally be expected.

3.4.3 Where the bilge pumps are automatically controlled, they are not be started when the oil pollution level is higher than accepted in Pt C, Ch 1, Sec 9.

3.4.4 The location of controls of any valve serving a sea inlet, a discharge below the waterline or a bilge injection system shall be so sited as to allow adequate time for operation in case of influx of water to the space, having regard to the time likely to be required in order to reach and operate such controls. If the level to which the space could become flooded with the yacht in the fully loaded condition so requires, arrangements shall be made to operate the controls from a position above such level.

3.4.5 Bilge level alarms are to be given at the main control station, the engineers' accommodation area and the navigating bridge.

4 Control of machinery

4.1 General

4.1.1 Under all sailing conditions, including manoeuvring, the speed, direction of thrust and, if applicable, the pitch of the propeller shall be fully controllable from the navigation bridge.

4.1.2 All manual operations or services expected to be carried out with a periodicity of less than 24 h are to be eliminated or automated, particularly for: lubrication, topping up of make up tanks and filling tanks, filter cleaning, cleaning of centrifugal purifiers, drainage, load sharing on main engines and various adjustments. Nevertheless, the transfer of operation mode may be effected manually.

4.1.3 A centralised control position shall be arranged with the necessary alarm panels and instrumentation indicating any alarm.

4.1.4 Parameters for essential services which need to be adjusted to a preset value are to be automatically controlled.

4.1.5 The control system shall be such that the services needed for the operation of the main propulsion machinery and its auxiliaries are ensured through the necessary automatic arrangements.

4.1.6 It shall be possible for all machinery essential for the safe operation of the yacht to be controlled from a local position, even in the case of failure in any part of the automatic or remote control systems.

4.1.7 The design of the remote automatic control system shall be such that in the case of its failure an alarm will be given. Unless impracticable, the preset speed and direction of thrust of the propeller shall be maintained until local control is in operation.

4.1.8 Critical speed ranges, if any, are to be rapidly passed over by means of an appropriate automatic device.

4.1.9 Propulsion machinery is to stop automatically only in exceptional circumstances which could cause quick critical damage, due to internal faults in the machinery. The design of automation systems whose failure could result in an unexpected propulsion stop is to be specially examined. An overriding device for cancelling the automatic shutdown is to be considered.

4.1.10 Where the propulsive plant includes several main engines, a device is to be provided to prevent any abnormal overload on each of them.

4.1.11 Where standby machines are required for other auxiliary machinery essential to propulsion, automatic changeover devices shall be provided.

4.2 Diesel propulsion plants

4.2.1 When a diesel engine is used for the propulsion plant, monitoring and control of equipment is to be performed according to Tab 2 for slow speed engines or Tab 3 for medium or high speed engines.

Table 2 : Main propulsion slow speed diesel engine

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand by Start	Stop
Fuel oil system							
• Fuel oil pressure after filter (engine inlet)	L	R					
						X	
• Fuel oil viscosity before injection pumps or fuel oil temperature before injection pumps (for engine running on heavy fuel)	H + L						
					X		
• Leakage from high pressure pipes where required	H						
Lubricating oil system							
• Lubricating oil to main bearing and thrust bearing pressure	L	R	X				
	LL			X			
						X	
• Lubricating oil to crosshead bearing pressure when separate	L	R	X				
	LL			X			
						X	
• Lubricating oil to camshaft pressure when separate	L						
	LL			X			
						X	

(1) Not required, if the coolant is oil taken from the main cooling system of the engine.
(2) Where outlet flow cannot be monitored due to engine design, alternative arrangement may be accepted.
(3) For engines of 220 kW and above.
(4) If separate lubricating oil tanks are installed, then an individual level alarm for each tank is required.
(5) For engines having a power of more than 2250 kW or a cylinder bore of more than 300 mm.

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand by Start	Stop
• Lubricating oil to camshaft temperature when separate	H						
					X		
• Lubricating oil inlet temperature	H						
					X		
• Thrust bearing pads or bearing outlet temperature	H	local	X				
	HH			X			
• Main, crank, crosshead bearing, oil outlet temp. or oil mist concentration in crankcase **(5)**	H		X				
• Flow rate cylinder lubricator (each apparatus)	L		X				
• Level in lubricating oil tanks or oil sump, as appropriate **(4)**	L						
• Lubricating oil to turbocharger inlet pressure	L						
• Turbocharger lubricating oil outlet temperature on each bearing	H						
Piston cooling system							
• Piston coolant inlet pressure	L		X **(1)**				
						X	
• Piston coolant outlet temperature on each cylinder	H	local	X				
• Piston coolant outlet flow on each cylinder **(2)**	L	local	X				
• Level of piston coolant in expansion tank	L						
Sea water cooling system							
• Sea water cooling pressure	L						
						X	
Cylinder fresh cooling water system							
• Cylinder fresh cooling water system inlet pressure	L	local **(3)**	X				
						X	
• Cylinder fresh cooling water outlet temperature or, when common cooling space without individual stop valves, the common cylinder water outlet temperature	H	local	X				
• Oily contamination of engine cooling water system (when main engine cooling water is used in fuel and lubricating oil heat exchangers)	H						
• Level of cylinder cooling water in expansion tank	L						
Fuel valve coolant system							
• Pressure of fuel valve coolant	L						
						X	
• Temperature of fuel valve coolant	H						
• Level of fuel valve coolant in expansion tank	L						

(1) Not required, if the coolant is oil taken from the main cooling system of the engine.
(2) Where outlet flow cannot be monitored due to engine design, alternative arrangement may be accepted.
(3) For engines of 220 kW and above.
(4) If separate lubricating oil tanks are installed, then an individual level alarm for each tank is required.
(5) For engines having a power of more than 2250 kW or a cylinder bore of more than 300 mm.

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand by Start	Stop
Scavenge air system							
• Scavenging air receiver pressure		R					
• Scavenging air box temperature (detection of fire in receiver, see [3.2.2])	H	local	X				
• Scavenging air receiver water level	H						
Exhaust gas system							
• Exhaust gas temperature after each cylinder	H	R	X				
• Exhaust gas temperature after each cylinder, deviation from average	H						
• Exhaust gas temperature before each turbocharger	H	R					
• Exhaust gas temperature after each turbocharger	H	R					
Miscellaneous							
• Speed of turbocharger		R					
• Engine speed (and direction of speed when reversible)		R					
					X		
• Engine overspeed **(3)**	H			X			
• Wrong way	X						
• Control, safety, alarm system power supply failure	X						

(1) Not required, if the coolant is oil taken from the main cooling system of the engine.
(2) Where outlet flow cannot be monitored due to engine design, alternative arrangement may be accepted.
(3) For engines of 220 kW and above.
(4) If separate lubricating oil tanks are installed, then an individual level alarm for each tank is required.
(5) For engines having a power of more than 2250 kW or a cylinder bore of more than 300 mm.

Table 3 : Main propulsion medium or high speed diesel engine

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand by Start	Stop
Fuel oil system							
• Fuel oil pressure after filter (engine inlet)	L	R					
						X	
• Fuel oil viscosity before injection pumps or fuel oil temperature before injection pumps (for engine running on heavy fuel)	H + L						
					X		
• Leakage from high pressure pipes where required	H						
Lubricating oil system							

(1) Only for medium speed engines having a power of more than 2250 kw or a cylinder bore of more than 300 mm. One oil mist detector for each engine having two independent outputs for initiating the alarm and shutdown would satisfy the requirement for independence between alarm and shutdown system.
(2) If without integrated self-contained oil lubrication system.
(3) For engine power > 500 kW/cyl.

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand by Start	Stop
• Lubricating oil to main bearing and thrust bearing pressure	L	R	X				
	LL			X			
						X	
• Lubricating oil filter differential pressure	H	R					
• Lubricating oil inlet temperature	H	R					
					X		
• Oil mist concentration in crankcase **(1)**	H			X			
• Flow rate cylinder lubricator (each apparatus)	L		X				
• Lubricating oil to turbocharger inlet pressure **(2)**	L	R					
Sea water cooling system							
• Sea water cooling pressure	L	R					
						X	
Cylinder fresh cooling water system							
• Cylinder water inlet pressure or flow	L	R	X				
						X	
• Cylinder water outlet temperature	H	R					
			X				
• Level of cylinder cooling water in expansion tank	L						
Scavenge air system							
• Scavenging air receiver temperature	H						
Exhaust gas system							
• Exhaust gas temperature after each cylinder **(3)**	H	R	X				
• Exhaust gas temperature after each cylinder **(3)**, deviation from average	H						
Miscellaneous							
• Engine speed		R					
					X		
• Engine overspeed	H			X			
• Control, safety, alarm system power supply failure	X						

(1) Only for medium speed engines having a power of more than 2250 kw or a cylinder bore of more than 300 mm. One oil mist detector for each engine having two independent outputs for initiating the alarm and shutdown would satisfy the requirement for independence between alarm and shutdown system.

(2) If without integrated self-contained oil lubrication system.

(3) For engine power > 500 kW/cyl.

4.3 Electrical propulsion plant

4.3.1 Documents to be submitted

The following additional documents are to be submitted to RINA:

- A list of the alarms and shutdowns of the electrical propulsion system
- When the control and monitoring system of the propulsion plant is computer based, a functional diagram of the interface between the programmable logic controller and computer network.

4.3.2 Alarm system

The following requirements are applicable to the alarm system of electrical propulsion:

- Alarms circuits of electrical propulsion are to be connected to the main alarm system on board. As an alternative, the relevant circuit may be connected to a local

alarm unit. In any case, a connection between the local alarm unit and the main alarm system is to be provided.

- The alarms can be arranged in groups, and shown in the control station. This is acceptable when a discrimination is possible locally.
- When the control system uses a computer based system, the requirements of Pt C, Ch 3, Sec 4 are applicable, in particular, for the data transmission link between the alarm system and the control system.
- Individual alarms are considered as critical and are to be individually activated at the control stations, and acknowledged individually.
- Shutdown activation is to be considered as an individual alarm.

4.3.3 Safety functions

The following requirements are applicable to the safety system of electrical propulsion:

- As a general rule, safety stop using external sensors such as temperature, pressure, overspeed, main cooling failure, stop of converter running by blocking impulse is to be confirmed by the automatic opening of the main circuit using a separate circuit.
- In order to avoid accidental stop of the propulsion line and limit the risk of blackout due to wire break, the tripping of the main circuit-breaker is to be activated by an emission coil with a monitoring of the line wire break.
- In the case of a single line propulsion system, the power limitation order is to be duplicated.
- As a general rule, when the safety stop is activated, it is to be maintained until local acknowledgement.

4.3.4 Transformers

For transformers, parameters according to Tab 4 are to be controlled or monitored.

4.3.5 Converters

For converters, parameters according to Tab 5, Tab 6 and Tab 7 are to be monitored or controlled.

4.3.6 Smoothing coil

For the converter reactor, parameters according to Tab 8 are to be monitored or controlled.

4.3.7 Propulsion electric motor

For propulsion electric motors, parameters according to Tab 9 are to be monitored or controlled.

4.3.8 All parameters listed in the tables of this item are considered as a minimum requirement for unattended machinery spaces.

Some group alarms may be locally detailed on the corresponding unit (for instance loss of electronic supply, failure of electronic control unit, etc.)

4.4 Shafting, clutches, CPP, gears

4.4.1 For shafting and clutches, parameters according to Tab 10 are to be monitored or controlled.

4.4.2 For controllable pitch propellers, parameters according to Tab 11 are to be monitored or controlled.

4.4.3 For reduction gears and reversing gears, parameters according to Tab 12 are to be monitored or controlled.

Table 4 : Transformers

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Earth failure on main propulsion circuits	I						
Circuit-breaker, short-circuit	I **(2)**			X			
Circuit-breaker, overload	I **(2)**			X			
Circuit-breaker, undervoltage	I **(2)**			X			
Temperature of winding on phase 1, 2, 3 **(1)**	G						
	I, H		X **(3)**				
	I, HH			X			
Temperature sensor failure (short-circuit, open circuit, supply failure)	G						

(1) A minimum of 6 temperature sensors are to be provided :
- 3 temperature sensors to be connected to the alarm system (can also be used for the redundant tripping of the main circuit-breaker)
- 3 temperature sensors connected to the control unit.

(2) To be kept in the memory until local acknowledgement.

(3) Possible override of slowdown by the operator.

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Cooling pump pressure or flow	G, L						
			X				
						X	
Cooling medium temperature	G, H			X			
Leak of cooling medium	G						
			X				

(1) A minimum of 6 temperature sensors are to be provided :
- 3 temperature sensors to be connected to the alarm system (can also be used for the redundant tripping of the main circuit-breaker)
- 3 temperature sensors connected to the control unit.

(2) To be kept in the memory until local acknowledgement.

(3) Possible override of slowdown by the operator.

Table 5 : Network converter

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Short-circuit current I max	I			X			
Overvoltage	G			X			
Undervoltage	G						
Phase unbalanced	I			(X) **(1)**			
Power limitation failure	I						
Protection of filter circuit trip	I						
Circuit-breaker opening operation failure	I						
Communication circuit, control circuits, power supplies, watchdog of control system according to supplier's design	G			X			

(1) This parameter, when indicated in brackets, is only advisable according to the supplier's requirements.

Table 6 : Motor converter

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Short-circuit current I max	I			X			
Overvoltage	G			X			
Undervoltage	G			X			
Phase unbalanced	I						

(1) Automatic switch-over to the redundant speed sensor system.

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Protection of filter circuit trip	I						
Communication circuit, control circuits, power supplies, watchdog of control system according to supplier's design	G			X			
Speed sensor system failure	G					X **(1)**	
Overspeed	I			X			
(1) Automatic switch-over to the redundant speed sensor system.							

Table 7 : Converter cooling circuit

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Air cooling temperature high	I	R					
Ventilation, fan failure	G						
			X				
Cooling pump pressure or flow low	G	R					
						X	
Cooling fluid temperature high	G						
Leak of cooling medium	G						
			X				
Temperature sensor failure (short-circuit, open circuit, supply failure)	G						

Table 8 : Smoothing coil

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Temperature of coil	I, H	R					
	I, HH						
Cooling air temperature	I, H						
Ventilation fan failure	G						
			X				
Cooling pump pressure or flow low	G	R					
						X	
Cooling fluid temperature high	G						
Leak of cooling medium	G						
			X				
Temperature sensor failure (short-circuit, open circuit, supply failure)	G						

Table 9 : Propulsion electric motor

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Motor			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Automatic tripping of overload and short-circuit protection on excitation circuit	G, H			H			
Loss of excitation	G			X			
Winding current unbalanced	G						
Harmonic filter supply failure	I						
Interface failure with power management system	I		X				
Earthing failure on stator winding and stator supply	I	R					
Temperature of winding on phase 1, 2, 3	G	R					
	I, H		X				
	I, HH			X			
Motor cooling air temperature	I, H	R					
Cooling pump pressure or flow	G ,L	R					
			X				
						X	
Cooling fluid temperature	G, H						
Leak of cooling medium	G						
			X				
Temperature sensor failure (short-circuit, open circuit, supply failure)	G						
Motor bearing temperature	G, H	R					
Bearing lubrication oil pressure (for self-lubricated motor, when the speed is under the minimum RPM specified by the manufacturer, shutdown is to be activated)	I, L	R					
			X				
						X	
Bearing lubrication oil pressure	G, L						
Turning gear engaged	I						
Brake and key engaged	I						
Shaft reduction gear bearing temperature	I, H						
Shaft reduction gear lubricating oil temperature	I, H						
Shaft reduction gear bearing pressure	I, L						
				X			

Table 10 : Shafting and clutches of propulsion machinery

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Temperature of each shaft thrust bearing (not applicable for ball or roller bearings)	H		X				
Sterntube bush oil gravity tank level	L						
Clutch lubricating oil temperature	H						
Clutch oil tank level	L						
Clutch control oil pressure	L						
	LL					X	

Table 11 : Controllable pitch propeller

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Control oil temperature	H						
Oil tank level	L						
Control oil pressure	L						
	LL					X	

Table 12 : Reduction gears/reversing gears

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Lubricating oil temperature	H	R **(1)**					
Lubricating oil pressure	L **(1)**	R				X	
	LL			X			
Oil tank level	L						
Plain bearing temperature	H						
	HH			X			
(1) May be omitted in the case of restricted navigation notation.							

4.5 Auxiliary systems

4.5.1 Where standby machines are required for other auxiliary machinery essential to propulsion, automatic change-over devices shall be provided.

Change-over restart is to be provided for the following systems:

- cylinder, piston and fuel valve cooling
- cylinder cooling of diesel generating sets (where the circuit is common to several sets)
- main engine fuel supply
- diesel generating sets fuel supply (where the circuit is common to several sets)
- sea water cooling for propulsion plant
- sea water to main condenser (main turbines)
- hydraulic control of clutch, CPP or main thrust unit
- thermal fluid systems (thermal fluid heaters).

4.5.2 When a standby machine is automatically started, an alarm is to be activated.

4.5.3 When the propulsion plant is divided into two or more separate units, the automatic standby auxiliary may be omitted, when the sub-units concerned are fully separated with regard to power supply, cooling system, lubricating system etc.

Some of the propulsive plants may be partially used for reasons of economy (use of one shaft line or one propulsion engine for instance). If so, automatic change-over, necessary for this exploitation mode, is to be provided.

4.5.4 Means shall be provided to keep the starting air pressure at the required level where internal combustion engines are used for main propulsion.

4.5.5 Where daily service fuel oil tanks are filled automatically, or by remote control, means shall be provided to prevent overflow spillages.

4.5.6 Arrangements are to be provided to prevent overflow spillages coming from equipment treating flammable liquids.

4.5.7 Where daily service fuel oil tanks or settling tanks are fitted with heating arrangements, a high temperature alarm shall be provided if the flashpoint of the fuel oil can be exceeded.

4.5.8 For auxiliary systems, the following parameters, according to Tab 13 to Tab 23 are to be monitored or controlled.

Table 13 : Control and monitoring of auxiliary electrical systems

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Main Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Electric circuit, blackout	X						
Power supply failure of control, alarm and safety system	X						

Table 14 : Incinerators

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Incinerator			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand-by Start	Stop
Combustion air pressure	L			X			
Flame failure	X			X			
Furnace temperature	H			X			
Exhaust gas temperature	H						
Fuel oil pressure	L						
Fuel oil temperature or viscosity , where heavy fuel is used	H + L						

Table 15 : Auxiliary boilers

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Boiler			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Water level	L + H			X	X		
Fuel oil temperature	L + H			X	X		
Flame failure	X			X			
Combustion air supply fan low pressure				X			
Temperature in boiler casing (fire)	H						
Steam pressure	H **(1)**			X	X		
Steam temperature				X **(2)**			

(1) When the automatic control does not cover the entire load range from zero load.
(2) For superheated steam over 330°C.

Table 16 : Fuel oil system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Fuel oil tank level, overflow	H **(1)**						
Air pipe water trap level on fuel oil tanks	H **(2)**						
Outlet fuel oil temperature	H **(4)**			X **(5)**	X		
Sludge tank level	H						
Fuel oil settling tank level	H **(1)**						
Fuel oil settling tank temperature	H **(3)**						
Fuel oil centrifugal purifier overflow	H			X			
Fuel oil in daily service tank level	L						
Fuel oil daily service tank temperature	H **(3)**				X		
Fuel oil in daily service tank level (to be provided if no suitable overflow arrangement)	H **(1)**						

(1) Or sight-glasses on the overflow pipe.
(2) Or alternative arrangement as per Pt C, Ch 1, Sec 10, [9.1.7].
(3) Applicable where heating arrangements are provided.
(4) Or low flow alarm in addition to temperature control when heated by steam or other media.
(5) Cut off of electrical power supply when electrically heated.

Table 17 : Lubricating oil system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Air pipe water trap level of lubricating oil tank See Pt C, Ch 1, Sec 10, [7.1.7]	H						
Sludge tank level	H						
Lubricating oil centrifugal purifier overflow	H						
(stop of oil supply)							X

Table 18 : Thermal oil system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Forced draft fan stopped				X			
Thermal fluid temperature	H						
				X			
Thermal fluid pressure							X
Flow through each element	L			X			
Heavy fuel oil temperature or viscosity	H + L				X		
Burner flame failure	X			X			
Flue gas temperature (when exhaust gas heater)	H			X			
Expansion tank level	L						X **(1)**
(1) Stop of burner and fluid flow.							

Table 19 : Hydraulic oil system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Pump pressure	L + H						
Service tank level	L **(1)**						
(1) The low level alarm is to be activated before the quantity of lost oil reaches 100 litres or 50% of the circuit volume , whichever is the lesser.							

Table 20 : Boiler feed and condensate system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Sea water flow or equivalent	L					X	
Vacuum	L						
	LL			X			
Water level in main condenser (unless justified)	H + L						
					X		
	HH			X			
Salinity of condensate	H						
Feed water pump delivery pressure	L					X	
Feed water tank level	L						
Deaerator inside temperature or pressure	L + H **(1)**						
Water level in deaerator	L + H						
Extraction pump pressure	L						
Drain tank level	L + H						
(1) In the case of forced circulation boiler.							

Table 21 : Compressed air system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand-by Start	Stop
Air temperature at compressor outlet	H						
Compressor lubricating oil pressure (except where splash lubrication)	LL			X			
Control air pressure after reducing valves	L + H	R					
					X		
Starting air pressure before main shut-off valve	L **(2)**	local + R **(1)**					
					X		
	X					X	
Safety air pressure	L + H						
					X		

(1) Remote indication is required if starting of air compressor is remote controlled, from wheelhouse for example.

(2) For starting air, the alarm minimum pressure set point is to be so adjusted as to enable at least four starts for reversible propulsion engines and two starts for non-reversible propulsion engines.

Table 22 : Cooling system

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			System			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Sea water pump pressure or flow	X					X	
	L						
Fresh water pump pressure or flow	X					X	
	L						
Level in cooling water expansion tank	L						

Table 23 : Thrusters

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Thruster			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Standby Start	Stop
Control oil temperature (preferably before cooler)	H						
Oil tank level	L						

4.6 Control of electrical installation

4.6.1 Where the electrical power can normally be supplied by one generator, suitable load shedding arrangement shall be provided to ensure the integrity of supplies to services required for propulsion and steering as well as the safety of the yacht.

4.6.2 In the case of loss of the generator in operation, adequate provision shall be made for automatic starting and connecting to the main switchboard of a standby generator of sufficient capacity to permit propulsion and steering and to ensure the safety of the yacht with automatic restarting of the essential auxiliaries including, where necessary, sequential operations.

4.6.3 The standby electric power is to be available in not more than 45 seconds.

4.6.4 If the electrical power is normally supplied by more than one generator simultaneously in parallel operation, provision shall be made, for instance by load shedding, to

ensure that, in the case of loss of one of these generating sets, the remaining ones are kept in operation without overload to permit propulsion and steering, and to ensure the safety of the yacht.

4.6.5 Following a blackout, automatic connection of the standby generating set is to be followed by an automatic restart of the essential electrical services. If necessary, time delay sequential steps are to be provided to allow satisfactory operation.

4.6.6 Monitored parameters for which alarms are required to identify machinery faults and associated safeguards are listed in Tab 24. These alarms are to be indicated at the control location for machinery as individual alarms; where the alarm panel with all individual alarms is installed on the engine or in the vicinity, a common alarm in the control location for machinery is required. For communication of alarms from the machinery space to the bridge area and accommodation for engineering personnel, detailed requirements are contained in [5].

5 Alarm system

5.1 General

5.1.1 A system of alarm displays and controls is to be provided which readily allows identification of faults in the machinery and satisfactory supervision of related equipment. This may be arranged at a main control station or, alternatively, at subsidiary control stations. In the latter case, a master alarm display is to be provided at the main control station showing which of the subsidiary control stations is indicating a fault condition.

5.1.2 Unless otherwise justified, separation of monitoring and control systems is to be provided.

5.1.3 The alarm system is to be designed to function independently of control and safety systems, so that a failure or malfunction of these systems will not to prevent the alarm system from operating. Common sensors for alarms and automatic slowdown functions are acceptable as specified in each specific table.

Table 24 : Auxiliary reciprocating I.C. engines driving generators *(1/1/2001)*

Symbol convention H = High, HH = High high, G = group alarm L = Low, LL = Low low, I = individual alarm X = function is required, R = remote	Monitoring		Automatic control				
			Engine			Auxiliary	
Identification of system parameter	Alarm	Indic	Slow-down	Shut-down	Control	Stand-by Start	Stop
Fuel oil viscosity or temperature before injection	L + H	local					
					X		
Fuel oil pressure		local					
Fuel oil leakage from pressure pipes	H						
Lubricating oil temperature	H						
Lubricating oil pressure	L	local				X	
	LL			X **(1)**			
Oil mist concentration in crankcase **(2)**	H			X			
Pressure or flow of cooling water, if not connected to main system	L	local					
Temperature of cooling water or cooling air	H	local					
Level in cooling water expansion tank, if not connected to main system	L						
Engine speed		local					
					X		
	H			X			
Fault in the electronic governor system	X						
Level in fuel oil daily service tank	L						
Starting air pressure	L						
Exhaust gas temperature after each cylinder **(3)**	H						

(1) Not applicable to emergency generator set.
(2) For engines having a power of more than 2250 kw or a cylinder bore of more than 300 mm.
(3) For engine power above 500 kW/cyl.

5.1.4 The alarm system shall be continuously powered and shall have an automatic change-over to a standby power supply in the case of loss of normal power supply.

5.2 Alarm system design

5.2.1 The alarm system and associated sensors are to be capable of being tested during normal machinery operation.

5.2.2 Insulation faults on any circuit of the alarm system are to generate an alarm, when an insulated earth distribution system is used.

5.2.3 An engineers' alarm is to be activated when the machinery alarm has not been accepted in the machinery spaces or control room within 2 minutes.

5.2.4 The alarm system is to have a connection to the engineers' public rooms and to each of the engineers' cabins through a selector switch, to ensure connection to at least one of those cabins.

5.3 Machinery alarm system

5.3.1 The local silencing of the alarms on the bridge or in accommodation spaces is not to stop the audible machinery space alarm.

5.3.2 Machinery faults are to be indicated at the control locations for machinery.

5.4 Alarm system on navigating bridge

5.4.1 Alarms associated with faults requiring speed reduction or automatic shutdown are to be separately identified on the bridge.

5.4.2 The alarm system is to activate an audible and visual alarm on the navigation bridge for any situation which requires action by or the attention of the officer on watch.

5.4.3 Individual alarms are to be provided at the navigation bridge indicating any power supply failures of the remote control of propulsion machinery.

6 Safety systems

6.1 General

6.1.1 Safety systems of different units of the machinery plant are to be independent. Failure in the safety system of one part of the plant is not to interfere with the operation of the safety system in another part of the plant.

6.1.2 In order to avoid undesirable interruption in the operation of machinery, the system is to intervene sequentially after the operation of the alarm system by:

- starting of standby units
- load reduction or shutdown, such that the least drastic action is taken first.

6.1.3 The arrangement for overriding the shutdown of the main propelling machinery is to be such as to preclude inadvertent operation.

6.1.4 After stoppage of the propulsion engine by a safety shutdown device, the restart is only to be carried out, unless otherwise justified, after setting the propulsion bridge control level on «stop».

7 Testing

7.1 General

7.1.1 Tests of automated installations are to be carried out according to Pt C, Ch 3, Sec 6 to determine their operating conditions. The details of these tests are defined, in each case, after having studied the concept of the automated installations and their construction. A complete test program is to be submitted and may be as follows.

7.1.2 The tests of equipment carried out alongside the quay under normal conditions of use include, for instance:

- the electrical power generating set
- the auxiliary steam generator
- the automatic bilge draining system
- automatic centrifugal separators or similar purifying apparatus
- automatic change-over of service auxiliaries
- detection of high pressure fuel leaks from diesel generating sets or from flexible boiler burner pipes.

7.1.3 Sea trials are used to demonstrate the proper operation of the automated machinery and systems. For this purpose, for instance, the following tests are to be carried out:

- Test of the remote control of propulsion:
  - checking of the operation of the automatic control system: programmed or unprogrammed starting speed increase, reversal, adjusting of the propeller pitch, failure of supply sources, etc.
  - checking of the crash astern sequence, to ensure that the reversal sequence is properly performed from full away, the yacht sailing at its normal operation speed. The purpose of this check is not to control the nautical performances of the yacht (such as stopping distance, etc.)
  - finally, checking of the operation of the whole installation in normal working conditions, i.e. as a general rule without watch-keeping personnel for the monitoring and/or running of the machinery during 4 h at least
  - The following procedure may, for instance, be chosen: «underway» during 2 h, then increasing to «full ahead». Staying in that position during 5 min. Then stopping for 15 min. Then, putting the control lever in the following positions, staying 2 minutes in each one: astern slow, astern half, astern full, full ahead, half ahead, stop, full astern, stop, ahead dead slow, half ahead, then increasing the power until «underway» position.

- Test of the operating conditions of the electrical production :
  - automatic starting of the generating set in the event of a blackout
  - automatic restarting of auxiliaries in the event of a blackout
  - load-shedding in the event of generating set overload
  - automatic starting of a generating set in the event of generating set overload.
- Test of fire and flooding system:
  - Test of normal operation of the fire detection system (detection, system faults)
  - Test of detection in the scavenging air belt and boiler air duct
  - Test of the fire alarm system
  - Test of protection against flooding.
- Test of operating conditions, including manoeuvring, of the whole machinery in an unattended situation for 4 h.

SECTION 2 MEANS TO PREVENT SEA AND AIR POLLUTION [GREEN_STAR (Y)]

1 General

1.1 Application

1.1.1 The requirements of this section apply to motor yachts with a length overall of 35 m and above.

The additional class notation **GREEN STAR (Y)** is assigned, in accordance with Pt A, Ch 1, Sec2, 6.3, to yachts fitted with efficient means to control and prevent the emission of polluting substances in the sea and in the air, in accordance with the requirements of this section.

1.2 Required certificates

1.2.1 In order to be granted and to maintain the **GREEN STAR (Y)** class notation, the validity of the following certificates is to be ensured:

- "International Oil Pollution Prevention Certificate" (IOPP Certificate), in accordance with MARPOL 73/78, Annex I, as applicable.
- "International Sewage Pollution Prevention Certificate" (ISPP Certificate) in accordance to MARPOL 73/78, Annex IV, as applicable.
- "International Anti Fouling System Certificate" (AFS Certificate) or statement of compliance or declaration, in accordance with IMO resolution MEPC.102(48) as amended.
- "Engine International Air Pollution Prevention Certificate " (EIAPP Certificate or Document of Compliance), in accordance with NOx technical code, as defined in [1.3.10].
- "International Air Pollution Prevention Certificate" (IAPP Certificate) or statement of compliance in accordance to MARPOL 73/78, Annex VI, as applicable.

Should one of the above mentioned certificates be suspended or not be renewed for any reason the **GREEN STAR (Y)** notation will be automatically suspended until the yacht is granted a new valid certificate.

1.3 Definitions

1.3.1 Sewage

Sewage means:

- drainage and other wastes from any form of toilets and urinals;
- drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs and scuppers located in such premises;
- drainage from spaces containing live animals; or
- other waste waters when mixed with the drainages defined above.

1.3.2 Treated sewage holding tank

Treated sewage holding tank means a tank used for the collection and storage of the effluent of the sewage treatment plant. Such tanks may be fitted upstream of the treatment system provided that the treatment system can be operated discontinuously with no adverse impact on the effluent quality.

1.3.3 Garbage

Garbage means all kinds of victual, domestic and operational waste excluding fresh fish and parts thereof, generated during the normal operation of the yacht and liable to be disposed of continuously or periodically, except those substances which are defined or listed in Annexes I, II, III and IV to MARPOL 73/78.

1.3.4 Harmful aquatic organisms and pathogens

Harmful aquatic organisms and pathogens means bacteria, plants and animals which can survive in a viable form in the ballast water and sediments carried in yachts.

1.3.5 Grey water

Grey water means drainage from dishwasher, galley, shower, laundry, bath, washbasin drains and WC scuppers.

1.3.6 TBT free antifouling system

Antifouling system means a coating, paint, surface treatment or device used to control or prevent attachment of organisms to the hull.

TBT free antifouling system means an antifouling system in compliance with the IMO Resolution MEPC.102(48) as amended.

1.3.7 Oily wastes

Oily wastes means the water removed from the machinery spaces bilges, used lube and hydraulic oils, sludge from fuel oil and from lube oil treatment systems.

1.3.8 Ozone depleting substances

Ozone depleting substances are those substances which are defined in paragraph 4 of Article 1 of the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, listed in Annexes A, B, C or E to the Protocol in force at the time of the application of these Rules.

In general, the following ozone depleting substances are used on yacht; however, this list is not to be considered comprehensive of all the ozone depleting substances that for any reason may be found in a yacht.

- Halon 1211 - Bromochlorodifluoromethane
- Halon 1301 - Bromotrifluoromethane
- Halon 2402
- Halon 114B2 - 1,2-Dibromo-1,1,2,2-tetrafluoroethane
- CFC-11 - Trichlorofluoromethane

- CFC-12 - Dichlorodifluoromethane
- CFC-113 - Trichloro-1,2,2-trifluoroethane
- CFC-114 - 1,2-Dichloro-1,1,2,2-tetrafluoroethane
- CFC-115 - Chloropentafluoroethane.

1.3.9 Global Warming Potential

Global Warming Potential (GWP) is the potential global warming of a gas compared with CO_2 on a time horizon of 100 years. Values of GWP for various refrigerants and gases are published by the US Environmental Protection Agency (EPA); if more than one value is listed, the lowest is to be used for the purpose of compliance with these Rules.

1.3.10 NOx technical code

NOx technical code is the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines adopted by IMO Conference MP/CONF.3/35 - Resolution 2, as amended.

1.3.11 Oil filtering equipment type approval

Oil filtering equipment installed on yachts the keel of which was laid down before 1 January 2005 are to be type approved according to resolution MEPC.60(33). Oil filtering equipment installed on yachts the keel of which was laid down on 1 January 2005 or later are to be type approved according to resolution MEPC.107(49) as amended.

1.3.12 Advanced sewage treatment system

For the purpose of these rules, a sewage treatment system can be defined as "advanced sewage treatment system" if the system is capable of obtaining a treated effluent complying with the polluting limits listed in Tab. 1.

1.3.13 Advanced grey waters treatment system

For the purpose of these rules, a grey waters treatment system can be defined as "advanced grey waters treatment system" if the system is capable of obtaining a treated effluent complying with the polluting limits listed in Tab. 1.

1.3.14 Recognized laboratory

In these rules recognized laboratory means a laboratory that, according to the granted national/international certification, is considered by the RINA qualified to perform the requested analysis.

1.4 Documents to be submitted

1.4.1 Plans and documents

Tab. 2 lists the plans and documents to be submitted.

1.4.2 Operational procedures and log books

Tab. 3 lists the procedures and record books to be submitted.

Table 1 : Allowable Effluent Parameter Values

No	Parameter description	Limit
1	Biological Oxygen Demand (BOD5)	≤ 25 (mg/l)
2	Chemical Oxygen Demand (COD)	≤ 125 (mg/l)
3	Total Suspended Solids (TSS)	≤ 35 (mg/l)
4	Total Nitrogen (N-total)	≤ 15 (mg/l)
5	Total Phosphorus (P-total)	≤ 2 (mg/l)
6	Free Chlorine (Cl_2)	= 0 (mg/l)
7	Faecal Coliforms (FC)	≤ 250 (colonies/100 ml MPN)

Table 2 : Documents to be submitted

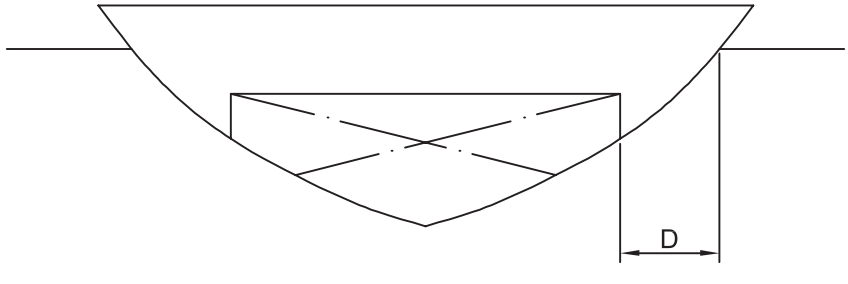
No.	A/I	Document
1	A	Drawings of the bilge system including volume of the bilge holding tank, see [2.1.2]
2	A	Drawings of oil tanks including volumes in order to verify the requirements of [2.2.4], as applicable
3	I	Copy of the type approval certificate of the oil filtering equipment and alarm, see [2.1.2.a]
4	A	Schemes of the fuel oil, lubricating oil and relevant overflow system containing the indication necessary to verify the requirements of [2.1.4 - 2.2.2]
5	A	Copy of the SOPE Plan including, if applicable, the list of emergency equipment, see [2.2.1]
6	I	Copy of the sewage treatment plant type approval certificate, see [2.3.2]
7	I	Technical documentation that the sewage treatment system is and advanced sewage treatment system, see [1.3.12]
8	A	Drawings of the sewage system including piping, holding tank for treated sewage and alarms, see [2.3.2]
9	A	Calculation of volume of holding tank for treated sewage, see [2.3.2]
10	A	Drawings of the grey waters system including piping, holding tank and alarms, see [2.4.1]
Note 1: A - to be submitted for approval in four copies I - to be submitted for information in 2 copies		

No.	A/I	Document
11	A	Calculation of volume of grey waters holding tank, see [2.4.1]
12	I	Technical documentation that the grey waters treatment system is and advanced grey waters treatment system, see [1.3.13]
13	A	Drawings of general arrangements containing the indication necessary to verify the requirements of [2.5.4 - 2.5.5]
14	A	Details and operating manual(s) of the ballast water treatment plant, if fitted, see [2.7], or technical drawings/documents necessary to verify the maximum volume of ballast water the yacht can carry or that the yacht cannot carry any ballast water
15	A	Data sheet with the list of refrigerants used, their quantity and GWP values, see [3.1.2]
16	A	Details plans of systems and equipment to limit SOx emissions, if fitted, see [3.3.1]
17	I	Incinerator type approval certificate, if fitted, see [3.5.1]
18	I	Copy of the EIAPP Certificate or statement of compliance for each engine detailed in [3.2]
19	I	Engine Technical File and record book for each engine detailed in [3.2]
20	A	Details and operating manual(s) of NOx control equipment, if fitted, see [3.2.4]
21	A	Details and operating manual(s) of SOx control equipment, if fitted, see [3.3.1]
22	I	Initial smokiness report, see [3.4.1]
Note 1: A - to be submitted for approval in four copies I - to be submitted for information in 2 copies		

Table 3 : Operational procedures and record books

No.	A/I	Document
1	I	Management procedures according to [2.1.5]
2	I	Oil Systems Record Book, see [2.2.4]
3	I	Sewage record book (not requested if an automatic recording device is fitted) , see [2.3.5]
4	I	Procedures for management of sewage according to [2.3.6]
5	I	Grey waters record book (not requested if an automatic recording device is fitted) , see [2.4.4]
6	I	Procedures for management of grey waters according to [2.4.5]
7	A	Garbage management plan including garbage record book and covering also requirements in [2.5.2.c - 2.5.3]
8	A	Ballast water management plan including ballast water record book, see [2.7]
9	I	Refrigerant log book and procedures, see [3.1.3 - 3.1.4]
10	I	Fuel management procedures for controlling sulphur content, see [3.3]
11	I	Incinerator management procedures according to [3.5.4]
Note 1: A - to be submitted for approval in four copies I - to be submitted for information in 2 copies		

Figure 1



2 Prevention of sea pollution

2.1 Oily wastes

2.1.1 Compliance with MARPOL 73/78 Annex I

The applicable requirements of MARPOL 73/78 Annex I, as amended, are to be complied with in addition requirements in [2.1.2] to [2.1.5] and [2.2.2] are to be fulfilled.

2.1.2 Bilge water

a) The yacht is to be provided with an oil filtering equipment, approved in accordance to IMO requirements, see [1.3.11].

b) All machinery spaces bilges have to be drained into an holding tank for pre-separation upstream of the oil separation and filtering equipment. The volume V of the holding tank is to be, in m^3, at least:

$$V = 1 + 3{,}5\ P \cdot 10^{-4}$$

where P is the power of the propulsion engine plant, in kW. In any event it is not required that the volume V is greater than:

- 5 m^3 for yachts till 100 m in length overall
- 10 m^3 for yachts of more than 100 m in length overall

c) The oil filtering equipment is to be provided with an oil content meter and with a 15 ppm alarm combined with automatic stopping device.

d) The effluent from the 15 ppm filtering equipment is to be capable of being re-circulated to the bilge or bilge water holding tank.

e) The tank is to be so arranged to allow from periodic removal of sediments.

2.1.3 Sludge

The sludge tank is to be so arranged to allow for periodic removal of sediments.

Sludge is to be disposed of either onboard through the incinerator or discharged ashore and is to be recorded in the oil record book.

Use of boilers for sludge disposal on board is not allowed.

2.1.4 Use of oil tanks for ballast

Irrespective of their volume tanks intended for fuel or lubricating oil cannot be used for ballast.

2.1.5 Procedures and checks

Procedures covering the following are to be available on board:

- oily waste management including discharge criteria;
- preparation, filling and maintenance of the oil record book;
- periodical calibration, at least every 12 twelve months, of the oil content meter referred to in [2.1.2.c]; documentation is to be kept on board for at least 36 months and made available during periodical surveys. The calibration should be done on two threshold values close to 15 and 20 ppm.
- In case the monograph of the oil water separator advise not to use some solvents for the cleaning of the machinery, a list of these solvents is to be available in machinery spaces.

2.2 Accidental oil discharge

2.2.1 Emergency response

Regardless of the yacht gross tonnage, an approved Shipboard Oil Pollution Emergency Plan (SOPE Plan) is to be available on board in accordance with Regulation 26 of MARPOL 73/78 Annex I.

2.2.2 Accidental spillage of oils

a) All fuel oil and lubricating oil tanks are to be fitted with:

- an overflow system and a high level alarm; or
- an overflow system and flow alarm in the overflow main; or
- two high level alarms (90% and 95% of filling).

b) Overflow tanks are to be provided with suitable piping for the re-use of the overflow.

c) On the weather and/or superstructure decks each fuel or lubricating oil tank vents, overflows and fill pipe connection is to be fitted with a fixed container or enclosed deck area with a capacity of:

- 80 litres if the gross tonnage of the yacht is between 300 and 1600
- 160 litres if the gross tonnage of the yacht is greater than 1600.

The above mentioned containment systems are not requested for venting pipes when their height is such that no oil overflow is possible.

2.2.3 Oil systems record book

The lube oil consumption of all systems having an oil to sea interface such as main and auxiliary engines sea water cooled, controlled pitch propellers, stern tubes, bow and stern thruster, stabilizers, PODs etc. is to be at least weakly recorded in a "Oil Systems record book" aiming at detecting, through unusually high consumptions, oil leakage through sealing.

The record book is to contain the list of all concerned systems, the consumption of each system recorded at least every week, corrective actions when carried out and is to be kept on board and made available during periodical surveys.

2.2.4 Protection of oil tanks against stranding or collision

For the purpose of this rule, oil tanks means tanks for fuel oil, sludge and for lubricating oil, whether or not for waste. Overflow tanks are to be included unless they are provided with an alarm for detection of liquid and operational procedures are foreseen for keeping such tanks empty. Double bottoms for lubricating circulating oil located under the main engine, if fitted, are excluded.

a) **Yachts with length overall of 35 m and above but less than 50 m.**

- The volume of each oil tank is not to be more than 10 m^3;
- Oil tanks must have a minimum distance D from the maximum draft water line of 700 mm, measured according to Fig.1. (see Note 1)

Note 1: as an alternative to the 700 mm minimum distance, provided that the minimum complement of the yacht is composed by at least 12 persons, the following pollution prevention equipment is to be available on board for the containment of possible oil spills: suitable floating booms and systems to lock the boom to the yacht.

This equipment is to be listed in the SOPE Plan as appropriate and procedures for the use of this emergency equipment are to be available on board.

b) **Yachts with length overall of 50 m and above but less than 100 m.**

- The volume of each oil tank is not to be more than 30 m^3.
- The following pollution prevention equipment is to be available on board for the containment of possible oil spills: suitable floating booms and systems to lock the boom to the yacht. This equipment is to be listed in the SOPE Plan as appropriate and procedures for the use of this emergency equipment are to be available on board.

c) **Yachts with length overall of more than 100 m.**

Oil tanks with a volume of more than 5 m^3, irrespective of their location, shall:

- have the bottom at a distance h above the base line equal to or greater than B/15, 2T/11 or 2 m, whichever is the lesser, with a minimum of 0,7 m. Small suction wells may extend below such limit for a height lower than 350 mm or h/2, whichever is the lesser, provided that they are as small as possible.
- have a minimum distance w in meters from the side and bottom shell plating, measured at any cross-section at right angles to the outer shell:

for tanks having a volume up to 2000 m^3

$$w = 0,01 \cdot (68,89 + 0,0657 \cdot v)$$

for tanks having a volume greater than 2000 m^3

$$w = 2$$

where:

v : is the volume of the tank, in m^3;

B : is the maximum breadth, in meters;

T : is the draft, measured at the middle of the length, in meters, between the full load waterline and the lower side of the keel. In case of hulls with a drop or ballast keel, the lower side of the keel is intended to mean the intersection of the longitudinal plane of symmetry with the continuation of the external surface of the hull.

d) **All Yachts**

No oil shall be stored in tanks forward of the collision bulkhead.

2.3 Sewage

2.3.1 Compliance with MARPOL 73/78, Annex IV

The applicable requirements of MARPOL 73/78 Annex IV, as amended, are to be complied with, in addition, requirements in [2.3.2] to [2.3.6] have to be fulfilled.

2.3.2 Sewage treatment plant

a) The yacht is to be provided with a sewage treatment plant certified according to the standards and test methods of MEPC.2(VI), as amended.

b) In addition, the yacht is to be equipped with holding tank(s) for treated sewage with sufficient capacity to allow storage of treated sewage when in port or in no discharge areas.

The minimum total capacity of such tank(s) shall be:

- 2 days for yachts with length overall less than 50 m;
- 4 days for yachts with length overall of 50 m and above

based on the maximum number of persons the yacht is certified to carry and to 96 litres/person/day if a conventional (flushometer) system is used and 11 litres/person/day if a vacuum system is used.

A reduced retention capacity of 1 day is accepted provided that an advanced sewage treatment system, see [1.3.12], is installed on board.

c) Treated sewage holding tank(s) are to be equipped with a high level alarm.

2.3.3 On board effluent re-use

In case an advanced sewage treatment system is installed on board and the treated effluent is re-used on board as technical water, on a case by case basis additional requirements will be considered in order to assure that no fecal coliforms are contained in the re-used effluent.

2.3.4 Discharge of sewage at sea

Sewage is to be discharged at sea at a distance from land not inferior to 1 nautical mail and with the yacht in navigation.

In case an advanced sewage treatment system, see [1.3.12], is installed on board no discharge requirements are imposed.

The discharging criteria shall not apply when the discharge of sewage is necessary for securing the safety of the yacht and those on board, saving life at sea or when the discharge is resulting from damage to the yacht or its equipment.

2.3.5 Sewage Record Book

All sewage discharges whether to sea or shore based facilities are to be recorded in a sewage record book with indication of date, location and quantity of sewage discharged.

If the sewage is discharged to sea, the records are to include information on the yacht speed and distance to the nearest land.

The sewage record book is to be kept on board for at least 36 months and made available during periodical surveys.

As an alternative, an automatic system, recording all the data to be filled in the sewage record book, can be accepted provided that an audible alarm activates when the discharge of sewage is performed not fulfilling the discharge criteria. These files are to be kept on board for at least 36 months and made available during periodical surveys.

2.3.6 Procedures

Procedures covering the following are to be available on board:

- ·sewage management including discharge criteria and use of holding tanks in port and no discharge areas;
- ·preparation, filling and maintenance of the sewage record book;
- ·periodical analysis, at least every 12 months, of samples of the effluent in order to verify compliance with the allowable limits. The analysis is to be performed by a recognized laboratory and documentation is to be kept on board for at least 36 months and made available during periodical surveys;
- ·disposal of sewage treatment plant residues ashore or by incineration.

2.4 Grey waters

2.4.1 Retention on board

a) The yacht is to be equipped with holding tank(s) for grey waters with sufficient capacity to allow storage of grey waters when in port or in no discharge areas.

   The minimum total capacity of such tank(s) shall be:

   - 2 days for yachts with length overall less than 50 m;
   - 4 days for yachts with length overall of 50 m and above

   based on the maximum number of persons the yacht is certified to carry and and to 200 litres/person/day.

   A reduced retention capacity of 1 day is accepted provided that an advanced grey waters treatment system, see [1.3.13], is installed on board.

b) Grey waters holding tank(s) are to be equipped with a high level alarm.

c) If the same tank(s) are used to hold treated sewage and grey water, the capacity of such tank(s) is to be at least the sum of the capacities for treated sewage holding tank, see [2.3.2], and for grey water; and the sewage treatment and discharge criteria apply.

2.4.2 On board effluent re-use

In case an advanced grey waters treatment system is installed on board and the treated effluent is re-used on board as technical water, on a case by case basis additional requirements will be considered in order to assure that no fecal coliforms are contained in the re-used effluent.

2.4.3 Discharge of grey waters at sea

Grey waters are to be discharged at sea at a distance from land not inferior to 1 nautical mail and with the yacht in navigation.

In case an advanced grey waters treatment system, see [1.3.13], is installed on board no discharge requirements are imposed.

The discharging criteria shall not apply when the discharge of grey water is necessary for securing the safety of the yacht and those on board, saving life at sea or when the discharge is resulting from damage to the yacht or its equipment.

2.4.4 Grey waters record book

All grey waters discharges whether to sea or shore based facilities are to be recorded in a grey waters record book with indication of date, location and quantity of sewage discharged.

If the grey waters are discharged to sea, the records are to include information on the yacht speed and distance to the nearest land.

The grey waters record book is to be kept on board for at least 36 months and made available during periodical surveys.

As an alternative, an automatic system, recording all the data to be filled in the grey waters record book, can be accepted provided that an audible alarm activates when the discharge of grey waters is performed not fulfilling the discharge criteria. These files are to be kept on board for at least 36 months and made available during periodical surveys.

2.4.5 Procedures

Procedures covering the following are to be available on board:

- grey waters management including discharge criteria and use of holding tanks in port and no discharge areas;
- preparation, filling and maintenance of the grey waters record book;
- if an advanced grey waters treatment system is installed on board, periodical analysis at least every 12 months of samples of the effluent in order to verify compliance with allowable limits. The analysis is to be performed by a recognized laboratory and documentation is to be kept on board for at least 36 months and made available during periodical surveys;
- disposal of grey waters treatment plant residues ashore or by incineration.

2.5 Garbage

2.5.1 Compliance with MARPOL 73/78 Annex V

The applicable requirements of MARPOL 73/78 Annex V, as amended, are to be complied with, in addition, requirements in [2.5.2] to [2.5.3] have to be fulfilled.

2.5.2 Placards

Regardless of MARPOL Annex V conditions, placards, which notify the crew and passengers of the garbage disposal requirements, are to be fixed as appropriate.

2.5.3 Garbage management plan and garbage record book

a) Regardless of MARPOL Annex V conditions, the yacht is to be provided with an approved garbage management plan to be kept on board. This plan is to provide written procedures for collecting, storing, processing and disposing of garbage, including the use of the equipment on board.

b) The plan is to be approved according to the IMO "Guidelines for the development of garbage management plans" MEPC.71(38) as amended, and is to be written in the working language of the crew.

c) Procedures are to be foreseen in order to collect and safely dispose ashore the following hazardous wastes:
   - Photographic and x-ray development fluids
   - Dry-cleaning solvents and waste fluids
   - Print shop fluids
   - Photocopying and laser printer cartridges
   - Unused pharmaceuticals and those which are past their use-by date
   - Batteries
   - Fluorescent and Mercury vapor lamp bulbs.

d) Records of discharges are to be maintained in the garbage record book.

2.5.4 Waste recycling

Selective collection of recyclable wastes is to be implemented on board.

Fore the purpose of this rule, recyclable wastes are:

- Plastic
- Aluminum
- Glass
- Paper-Cardboard

2.5.5 Biological garbage collection

A suitable refrigerated space for the disposal of biological garbage is to be available on board. Temperature in the space is not to be above 10C°.

2.5.6 Hazardous wastes collection

A suitable space for the disposal of hazardous wastes is to be available on board.

2.6 Antifouling system

2.6.1 Anti-fouling systems for the hull shall be of TBT-free type, according to IMO resolution MEPC.102(48), as amended.

A valid Anti-fouling system (AFS) certificate, or document of compliance, or declaration is to be available on board.

2.7 Transfer of harmful aquatic organisms and pathogens through ballast water

2.7.1 Yachts with length overall of 50 m and above, with a ballast water capacity above 8 m^3 are to be provided with an approved ballast water management plan, including a ballast water record book developed in accordance with IMO Res. A.868(20) and used for ballast water management.

Yachts with length overall less than 50 m or with a ballast water capacity less than 8 m^3 are to be provided only with an approved ballast water management plan developed in accordance with IMO Res. A.868(20) and used for ballast water management.

The yacht shall not be required to deviate from its intended voyage, or delay the voyage in order to comply with these requirements.

Systems for the treatment of ballast water may be accepted in place of the ballast water exchange, subject to consideration by the RINA.

In case the yacht does not have ballast water tanks, no requirements are enforced and the "no ballast condition" will be reported in the class certificate as appropriate.

3 Prevention of air pollution

3.1 Ozone depleting substances

3.1.1 General

The following requirements apply to yachts with centralised refrigeration systems such as:

- centralised refrigeration systems for provision stores;
- centralised air conditioning plants.

They do not apply to domestic type stand-alone refrigerators and air conditioning units.

3.1.2 Ozone depleting substances

a) The use of halogenated substances (e.g. Halon and CFC) as refrigerant or fire fighting mean is prohibited, with the exception of hydro-chlorofluorocarbons ($HCFC_n$), which are permitted until 1 January 2020.

b) Refrigerants of centralised refrigeration systems shall have a global warming potential, GWP < 2000.

3.1.3 Control of leakage

Annual refrigerants leakage shall be less than 10% of the total refrigerant charge of each system. Leakages due to damage of the system are not considered for the annual leakage.

The leakage shall be documented by consumption figures recorded in a refrigerant log book to be kept on board and made available during periodic surveys.

Procedures need to be established such that, in case the annual leakage exceeds the maximum allowed corrective actions are undertaken.

3.1.4 Procedures and checks

Procedures covering the following are to be available on board:

- refrigerant management including control of leakage and preparation, filling and maintenance of the refrigerant log book according to [3.1.3];
- minimization of the risk of depleting the refrigerant in the various operating conditions including during maintenance.

3.2 Emissions of oxides of nitrogen (NOx)

3.2.1 Applicability

a) The following requirements apply to all diesel engines, irrespective of the service, with a rated power of more than 130 kW, installed on board a yacht, with the exceptions indicated in b).

b) They do not apply to diesel engines installed in lifeboats and any other diesel engines intended to be used solely in an emergency situation (e.g. emergency diesel engines if not used as port generator), irrespective of their rated power.

3.2.2 Allowable emission levels

NOx engines emissions are to be within allowable limits fixed by MARPOL Annex VI.

3.2.3 After treatment devices and other NOx control methods

a) When an after treatment device is installed the compliance with the above limits may be checked downstream according to the NOx technical Code.

b) [3.2.4] applies to such devices and methods.

3.2.4 Engine certificate, technical file and record book

For engines referred to in 3.2.1 the following are to be provided:

a) The Engine International Air Pollution Prevention Certificate (EIAPP) or document of Compliance, issued according to the NOx technical code, is to be kept on board and made available for verification during periodic surveys.

b) The approved engine technical file is to be kept on board and made available for verification during periodic surveys.

The following information need to be included in the engine technical file:

- List of emission relevant engine parameters and their allowable values
- On board verification procedure of such parameters
- List of emission relevant engine components and method of identification

3.2.5 NOx control equipment

If NOx emissions are controlled by:

- after treatment (e.g. selective catalytic reduction); or
- other methods (e.g. emulsion of water in fuel, intake air humidification, direct water or steam injection); the relevant equipment will be subject to special consideration by the RINA.

Such equipment are to be designed and installed so that:

- means are to be provided to check proper operation of the equipment;
- failure of the NOx emission control system and/or equipment should not affect the normal functioning of the engine.

3.3 Emissions of sulphur (SOx)

3.3.1 Maximum sulphur content in the fuel oil

The sulphur content of any fuel oil used on board yachts is not to exceed 1.5% by mass.

Where alternative methods are used to comply with SOx limits, such as exhaust gas cleaning or other emission control system, the requirements of MARPOL 73/78, Annex VI, Reg. 14(4)(b) have to be fulfilled.

3.3.2 Procedures for the control of SOx emissions

Procedures covering the following are to be available on board:

a) **Fuel oil management procedures**

These requirements apply only for yachts of 400 GT and above using low sulphur fuels.

Procedures covering the following are to be available on board:

1) maximum sulphur content to be specified in the fuel oil purchase orders and to be verified in the fuel oil receipt at the delivery of bunker;

2) records of purchase orders, receipts are to be kept on board for at least 36 months and made available for verification during periodic surveys;

3) for yachts using fuels classified according to the ISO 8217 standard as DMB, DMC, or classified as residual fuels (RM) it is requested that a laboratory check of samples of the sulphur contents in the delivered bunkers is carried out according to a recognized standard acceptable to the RINA. Laboratory analysis, including results are to be kept on board for at least 36 months and made available for verification during periodic surveys.

b) **Maintenance procedures**

These requirements apply only for yachts fitted with SOx emissions control system.

Procedures covering the maintenance of the SOx emission control system referred to in [3.3.1] are to be available on board.

3.4 Emissions of particulate matter (PM)

3.4.1 Applicability

a) The following requirements apply to all diesel engines, irrespective of the service, with a rated power of more than 130 kW, installed on board a yacht, with the exceptions indicated in 3.4.1.b.

b) They do not apply to diesel engines installed in lifeboats and any other diesel engines intended to be used solely in an emergency situation (e.g. emergency diesel engines if not used as port generator), irrespective of their rated power.

3.4.2 Engine planned maintenance

In order to ensure that diesel engines maintenance is carried out in due time, according to the manufacturer specifications, a maintenance schedule and procedures are to be available on board.

The schedule will contain a list of all parts to be maintained and for each part the following information:

- date of the last maintenance;
- actual running hours since last maintenance;
- maximum running hours allowed according to the manufacturer.

3.4.3 Smokiness

a) **Initial smokiness report**

The manufacturer of the engine has to provide an initial smokiness report containing data of the opacity of the exhaust emissions from the diesel engines installed on board, measured at 75% of the maximum power output. The report will contain identification of the tested engine, the standard according to which the analysis was carried out and the opacity value.

In case the initial smokiness report provided by the manufacturer is not available, a measurement campaign is to be carried out on board by a recognized laboratory, provided that the engine settings and adjustment are in compliance with the manufacturers requirements.

Initial smokiness reports are to be kept on board and made available for verification during periodic surveys.

b) **Periodical smokiness measurements**

Periodical analysis, at least every 12 months, of the diesel engines exhaust emissions opacity is to be carried out. The analysis is to be performed at 75% of the maximum power output by a recognized laboratory and according to the same test method listed in the initial smokiness report. In case a different test method is used, the report is to detail technical information in order to make the different measurements comparable.

Reports are to be kept on board for at least 36 months and made available for verification during periodic surveys.

When the measured opacity of the exhaust emissions is above the value listed in the initial smokiness report, reasons are to be investigated and corrective actions are to be taken as necessary.

3.5 Incinerators

3.5.1 Constructional requirements

Where fitted, onboard incinerators, are to be type approved according to MEPC.76(40) as amended.

3.5.2 Sludge disposal

Sludge can only be disposed of on board through incineration. Sludge disposal through incineration is to be duly recorded in the oil record book.

3.5.3 Substances not permitted to be incinerated

Shipboard incinerators cannot be used to incinerate the following substances:

- polychlorinate biphenyls (PCBs);
- garbage, as defined in Annex V of "MARPOL 73/78" containing more than traces of heavy metals.

3.5.4 Procedures

Procedures covering the following are to be available on board:

- the operation of the incinerator(s) within the limits (e.g. temperature, humidity, ecc.) recommended by the manufacturer;
- substances not permitted to be incinerated.

4 Inspections, tests and surveys

4.1 Inspections and testing during construction

4.1.1 Systems or equipment, which are installed on board in order to comply with the requirements of this section, are to be surveyed and tested according to the applicable parts of these Rules.

4.2 Initial survey

4.2.1 Following the satisfactory review and approval of the plans and other documentation requested in this Section, an initial survey is to be carried out on-board in order to:

- verify that hull and machinery arrangements are in accordance with the approved documentation;
- test, at the presence of the Surveyor and under working conditions, the equipment and systems covered by the requirements of this section including their control, monitoring and alarm;
- verify the presence on board of the certificates, record and log books requested by this section;
- carry out the engine parameter check according to the engine technical file, of the engines referred to in 3.2.

4.3 Periodical surveys

4.3.1 During periodical surveys, the checks and verifications, requested in Pt. A Ch.4 Sect. 3 are to be carried out as applicable.

SECTION 3 COMFORT ON BOARD [COMF (Y)]

1 General

1.1

1.1.1 The application of these Rules aims at the assessment and improvement of passengers and crew comfort on board yachts classed by RINA.

1.2

1.2.1 The criteria considered for the assessment of personal comfort are based on the evaluation of airborne noise and structural vibration levels during normal navigation. These rules do not consider the effects of the craft motions.

1.3

1.3.1 These rules are based on the most recent international standards and requirements relevant to the measurement and control of noise and vibration issued, in particular by ISO.

1.4

1.4.1 Compliance with these rules is verified by means of measurements to be carried out on-board in the conditions and locations indicated.

1.5

1.5.1 Measurements have to be carried out by either a RINA's surveyor or by a technician from a company of recognised capability by RINA. In the latter case, measurements have to be carried out under surveillance of a RINA's surveyor.

1.6

1.6.1 These rules define the limits and criteria of acceptability of noise and vibration levels onboard. They indicate the international reference standards, the procedure and the instrumentation necessary to carry out measurements.

2 Field of application and special notation

2.1 Field of application

2.1.1 These rules apply to yachts classed in compliance with RINA's "Rules for the classification of Charter Yachts" .

2.1.2 These rules apply to spaces in the passenger and crew living and transfer areas. They do not apply to machinery spaces.

2.2 Special notation

2.2.1 Upon request, the craft complying with these rules are assigned the special notation **COMF (Y) (X, Y))** as per Part A of these Rules .

In the notation acronym, X and Y are respectively the noise and vibration parameters of merit. They are calculated, according to what specified in [4], on the basis of the averaged results of measurements in relation to the bounds given in Tables 1 and 2 respectively for noise and vibrations.

2.2.2 The special notation is assigned if both of the parameters of merit are larger than 30.

2.2.3 In order to maintain the special notation, whenever the craft is subject to repairs, modifications or refitting which, at the discretion of RINA, can affect its comfort characteristics, compliance with these rules is to be confirmed.

2.2.4 On the occasion of Class Renewal Surveys, the maintenance of comfort characteristics can be subject to verification at the discretion of RINA.

3 Definitions

3.1 Yachts

3.1.1 Displacement Yacht

A craft that is supported by the buoyancy of the water it displaces. In general, for the purposes of these rules, a displacement vessel is a craft having $\mathbf{V} / \mathbf{L}^{0,5} \leq 4$

where:

V : maximum design speed, in knots, of the vessel at full load displacement

L : length, in metres, on the full load waterline.

3.1.2 Semi-planing Yacht

A craft that is supported partially by the buoyancy of the water it displaces and partially by the dynamic pressure generated by the bottom surface running over the water.

3.1.3 Planing Yacht

A craft in which the dynamic lift generated by the bottom surface running over the water supports the total weight of the vessel.

3.2 Public spaces

3.2.1 All passengers living areas including salons, recreation rooms, dining rooms, game rooms and similar spaces.

3.3 Wheel house

3.3.1 Is the enclosed area from which navigation and control of the craft is exercised.

3.4 Noise

3.4.1 Audible sound waves level, generally of a random nature, in the 20 to 18000 Hz frequency range.

3.5 Noise level (or A weighted sound pressure level)

3.5.1 The quantity measured by a sound level meter in which the response in frequency is considered according to the A-weighting curve (cf. publication IEC 651).

3.6 Sound pressure level

3.6.1 Measure of noise level L, in dB units, given by:

$$L = 20\log_{10}\frac{p}{p_0}$$

where:

p : effective value (rms) of the measured sound pressure, in Pa

p_0 : 20×10^{-6} Pa (reference level).

3.7 Vibration

3.7.1 Time variation of the value of a physical quantity described by either the motion or the position of a mechanical system when this value is alternatively larger or smaller than an mean reference value.

As far as these rules are concerned, the physical quantity is the structural velocity, measured in mm/s, in the frequency range from 1 to 100 Hz.

4 Criteria

4.1 Measurement conditions

4.1.1 Measurements have to be carried out both during navigation and with the craft at berth.

4.2 Navigation - Transit conditions

4.2.1 Measurements shall be carried out with the craft at full load conditions. Different conditions can be considered if accepted as equivalent for the purposes of these rules at the discretion of RINA.

4.2.2 Measurements shall be carried out at the normal cruising speed of the craft with propulsion plants working at the normal service speed.

4.2.3 During measurements, all auxiliary systems, navigational equipment, radio system, radar etc. shall be operating in normal service conditions.

4.2.4 Forced ventilation and air conditioning systems (HVAC plants) shall be operating in normal service conditions.

4.2.5 Whenever possible, doors and windows shall be closed.

4.2.6 Rooms and locals shall be completely furnished and fitted.

4.3 Navigation - Environmental conditions

4.3.1 Water depth shall be sufficiently high so that the measurements are not affected by reflections on the sea bed.

4.3.2 Meteorological conditions shall be in general within the following limits:

- wind: non stronger than Beaufort 3 - strong breeze (speed 7 to 10 knots),
- waves: non stronger than force 3 - rough (significant wave height 0.5 to 1.25 m).

4.4 At berth trials

4.4.1 Measurements shall be carried out at full load conditions. Different conditions can be considered if accepted as equivalent for the purposes of these rules at the discretion of RINA.

4.4.2 During measurements, all auxiliary systems, navigational equipment, radio system, radar etc. shall be operating in normal service conditions at berth.

4.4.3 Forced ventilation and air conditioning systems (HVAC plants) shall be operating in normal service conditions at berth.

4.4.4 Whenever possible, doors and windows shall be closed.

4.4.5 Rooms and locals shall be completely furnished and fitted.

4.5 Noise

4.5.1 Measurement positions

Measurements at berth shall be carried out in the wheel house and in all living or transit, passengers areas according to the indications of Table 1.

Measurements during navigation shall be carried out in all the locations considered for the craft at berth, with the exception, for semi-planing or planing vessels, of open pub-

lic spaces and of passenger cabins for which no measurements are foreseen during navigation.

Measuring positions shall be uniformly distributed according to the indications provided in section 5.1.3; Their number and location shall be previously agreed with RINA.

At the discretion of RINA, additional measurements shall be carried out in particular locations within the measurement area.

4.5.2 Bounds

Noise level shall be measured in dB units with A weighting filter, [dB(A)]. For each space typology, bounds for the calculation of the noise merit parameter, X, are given in Table 1.

4.5.3 Acceptance criteria

In general, in each measurement point the noise level shall not exceed the upper bound, L_{max}, given in Table 1. At the discretion of RINA, higher values can be accepted provided they are localised and limited to no more than 5% of the total number of measuring positions.

4.5.4 Noise merit parameter

For the purposes of these rules, the noise merit parameter, X defined in 2.2.1, is calculated by the following procedure.

a) for each measurement point, the noise merit coefficient, Cmr, is calculated by linear interpolation as follows:

$$Cmr = 0 \quad L_{mis} > L_{max}$$

$$Cmr = 1 - \frac{L_{mis} - L_{min}}{L_{max} - L_{min}} \quad L_{min} \le L_{mis} \le L_{max}$$

$$Cmr = 1 \quad L_{mis} < L_{max}$$

where:

L_{mis} : recorded noise level

L_{min} : lower bound for the noise level (Table 1)

L_{max} : upper bound for the noise level (Table 1).

b) the noise merit parameter, X, is the average value of the merit coefficients, Cmr, times 100.

4.6 Airborne noise insulation index

4.6.1 For craft having length overall larger than 24 m, the walls of the passenger cabins shall comply with the following airborne noise insulation limits, (Ia) as per ISO 717 and ISO 140:

- walls between two passenger cabins or between a passenger cabin and a room non containing machinery or auxiliaries: Ia = 30 dB,
- walls between a passenger cabin and a room containing either machinery or auxiliaries: Ia = 45 dB.

In special cases different limits can be at the discretion of RINA

4.6.2 The noise insulation characteristics of the walls shall be verified on board and on accordance to the ISO standards mentioned in 4.6.1.

4.7 Vibrations

4.7.1 Measurement positions

Measurements in navigation and at berth, shall be carried out in operative compartment and in all passengers living or transit areas as specified in Table 2.

In navigation, measurements shall be carried out in all locations considered for the craft at berth with the exception, for non displacement craft, of open public spaces and passengers' cabins for which no measurements are foreseen in navigation.

Measuring positions shall be uniformly distributed according to the indications provided in section 5.2.3; Their number and location shall be previously agreed with RINA.

At the discretion of RINA, additional measurements shall be carried out in particular locations within the measurement area.

4.7.2 Bounds

The vibration level is equal to the peak structural velocity, measured in mm/s, recorded in the frequency range from 0 to 100 Hz, as per ISO 6954. For each space typology, bounds for the calculation of the vibration merit parameter, Y, are given in Table 2.

4.7.3 Acceptance criteria

In general, in each measurement point the vibration level shall not exceed the upper bound, $V_{max,}$ given in Table 2. At the discretion of RINA, higher values can be accepted provided they are localised and limited to no more than 5% of the total number of measuring positions.

4.7.4 Vibration merit parameter

For the purposes of these rules, the noise merit parameter, Y defined in 2.2.1, is calculated by the following procedure.

a) for each measurement point, the vibration merit coefficient, Cmv, is calculated by linear interpolation as follows:

$$Cmv = 0 \quad V_{mis} > V_{max}$$

$$Cmv = 1 - \frac{V_{mis} - V_{min}}{V_{max} - V_{min}} \quad V_{min} \le V_{mis} \le V_{max}$$

$$Cmv = 1 \quad V_{mis} < V_{max}$$

where:

V_{mis} : recorded noise level

V_{min} : lower bound for the vibration level (Table 2)

V_{max} : upper bound for the vibration level (Table 2).

b) the vibration merit parameter, Y, is the average value of the merit coefficients, Cmv, times 100.

5 Measurement procedure

5.1 Noise

5.1.1 Initial conditions

The following data and conditions shall be recorded and included in the report:

- craft loading condition;
- test conditions (navigation / at berth);
- propulsion machinery, main auxiliaries, navigational aids, radio and radar sets;
- doors and windows status (closed or open);
- water depth;
- environmental conditions (wind and waves);
- noise sources due to external factors such as presence of additional personnel, ongoing repair or fitting work, etc.

5.1.2 Instrumentation

Noise levels measurements shall be carried out by means of precision grade sound level meters. These sound level meters shall comply with either IEC 651 type 1 requirements or a standard accepted as equivalent by RINA.

A suitable acoustic calibrator, approved by the producer of the sound level meter shall be used.

When a octave band filter is used, jointly or separately from a sound level meter, it shall comply with either IEC 225 or a standard accepted as equivalent by RINA.

Microphones shall be of the random incidence type and shall comply with either IEC 179 class 1 or a standard accepted as equivalent by RINA.

Both the instrumentation for noise level measurement and the acoustic calibrator shall be properly calibrated according to a recognised standard.

5.1.3 Measurements

Noise level shall be recorded in dB using the A weighting filter [dB(A).

The sound level meter shall be set for slow response and calibrated with an acoustic calibrator before and after the measurement campaign.

Measurements shall be carried out keeping the microphone approximately at 1.5 m from the floor and at least at 1.0 m from the walls.

The distance between two measuring positions shall be in general within 2.0 and 4.0 m. At least two measurement positions shall be considered in each local.

When carrying out measurements in open locals, a suitable wind screen shall be used to protect the microphone against the action of the wind. The effect of this wind screen when used in absence of wind shall be such that the difference between the measured noise level with and without the wind screen is less than 0.5 dB. .

5.1.4 Reporting of results

Results shall be submitted in a report which includes:.

- the main characteristics of the craft and of the measurement instrumentation;
- the noise measurements plan;
- a summary table showing, for each measurement carried out in either navigation or at berth, the recorded noise levels and the corresponding noise merit coefficient Cmr;
- the noise merit parameter, X;

Table 1 : Noise limits

LOCAL	Navigation		At berth	
	L_{min} [dB(A)]	L_{max} [dB(A)]	L_{min} [dB(A)]	L_{max} [dB(A)]
Operation compartment	55	65	40	50
Public spaces (closed)	60	75	40	50
Public spaces (open recreational areas)	-	-	50	60
Passengers' cabins	-	-	40	50

Table 2 : Vibration limits

LOCAL	Navigation		At berth	
	V_{min} [mm/s]	V_{max} [mm/s]	V_{min} [mm/s]	V_{max} [mm/s]
Operation compartment	2	5	2	4
Public spaces (closed)	2	5	1	3
Public spaces (open recreational areas)	-	-	2	4
Passengers' cabins	-	-	1	3

5.2 Vibrations

5.2.1 Initial conditions

The following data and conditions shall be recorded and included in the report:

- craft loading condition;
- test conditions (navigation / at berth);
- propulsion machinery, main auxiliaries, navigational aids, radio and radar sets;
- doors and windows status (closed or open);
- water depth;
- environmental conditions (wind and waves);
- vibrations sources due to external factors such as ongoing repair or fitting work

5.2.2 Instrumentation

Vibration levels shall be recorded by means of a portable analyser (vibrometer).

Accelerometers shall be able to properly operate in the frequency range of investigations, namely 0 to 100 Hz., according to ISO 6954.

A suitable calibrator, recommended by the producer of the vibrometer, shall be used.

Both the instruments for vibrations recording and the calibrator shall be calibrated according to a recognised standard.

5.2.3 Measurements

Vibration levels measurements shall be carried out recording the spectral peak of structural velocity, in mm/s, in the frequency range from 0 to 100 Hz, by means of a portable analyser connected to an accelerometer.

The accelerometer shall be in contact with the floor of the room and shall be in vertical position. Contact with the floor is in general realised by means of a magnet to which the accelerometer is fixed. In presence of carpets or other material which could dump vibrations, the accelerometer shall be fixed to a metallic plate placed above the measuring point.

The distance between two measuring positions shall be in general within 2.0 and 4.0 m. At least two measuring positions shall be considered in each local.

5.2.4 Reporting of results

Results shall be submitted in a report which includes, in addition to what specified under 5.1.4:

- for each vibration measuring point, the spectrum of the structural velocity in the frequency range of investigation as produced by the portable analyser completed with an indication of the frequency and value of main peaks;
- a summary table showing the recorded frequency and maximum spectral value (vibration level) in each measuring point and the corresponding vibration merit coefficient Cmv;
- the vibration merit parameter, Y.

SECTION 4 ADDITIONAL SAFETY REQUIREMENTS (ASR)

1 General

1.1 Application

1.1.1 The additional class notation **ASR** is assigned, in accordance with Pt A, Ch 1, Sec 2, (6.5.1), to yachts for which RINA, in addition to the applicable requirements of Pt E for the purpose of the classification, at Owner's/Shipyard's request, verify compliance to the following safety requirements set out by the flag Administration:

- Damage Stability;
- Life-Saving Appliances;
- Navigation Lights, Shapes and Sound Signals.

SECTION 5 IN-WATER SURVEY ARRANGEMENTS [INWATERSURVEY (Y)]

1 General

1.1 Application

1.1.1 The additional class notation **INWATERSURVEY (Y)** is assigned, in accordance with Pt A, Ch 1, Sec 2, [6.6.1].

1.2 Documentation to be submitted

1.2.1 Plans

Detailed plans of the hull and hull attachments below the water line are to be submitted to RINA in triplicate for approval. These plans are to indicate the location and/or the general arrangement of:

- all shell openings
- stem
- rudder and fittings
- sternpost
- propeller, including the means used for identifying each blade
- anodes, including securing arrangements
- bilge keels
- welded seams and butts.

The plans are also to include the necessary instructions to facilitate the divers' work, especially for taking clearance measurements.

Moreover, a specific detailed plan showing the systems to be adopted in order to assess, when the yacht is floating, the slack between pintles and gudgeons is to be submitted to RINA in triplicate for approval.

1.2.2 Photographs

As far as practicable, a photographic documentation, used as a reference during the in-water surveys, of the following hull parts is to be submitted to RINA:

- propeller boss
- rudder pintles, where slack is measured
- typical connections to the sea
- directional propellers, if any
- other details, as deemed necessary by RINA on a case by case basis.

1.2.3 Documentation to be put on board

The Owner is to put on board of the yacht the plans and documents given in [1.2.1] and [1.2.2], and they are to be made available to the Surveyor and the divers when an inwater survey is carried out.

2 Structure design principles

2.1

2.1.1 Marking

Identification marks and system are to be supplied to facilitate the in-water survey. In particular, the positions of transverse watertight bulkheads are to be marked on the hull.

2.1.2 Rudder arrangements

Rudder arrangements are to be such that rudder pintle clearances and fastening arrangements can be checked.

2.1.3 Tailshaft arrangements

Tailshaft arrangements are to be such that clearances (or wear down by poker gauge) can be checked.

SECTION 6 SHAFT MONITORING [MON-SHAFT (Y)]

1 General

1.1 Applicability of MON-SHAFT (Y) notation

1.1.1 The additional class notation **MON-SHAFT (Y)** is assigned, in accordance with Pt A, Ch 1, Sec 2, [6.7.1], to yachts complying with the requirements of this Section.

1.1.2 This notation is assigned only to yachts having tailshafts arranged with oil lubricated stern bearing and with approved oil sealing glands.

1.1.3 The assignment of this notation allows a reduced scope for complete tailshaft surveys; see Pt A, Ch 2, Sec 2, [4.5.4].

2 Requirements for the issuance of the notation

2.1 Arrangement

2.1.1 In order for the notation **MON-SHAFT (Y)** to be granted, the stern bearing is to be arranged with facilities for measurement of bearing wear down.

2.2 Lubricating oil analysis

2.2.1 Item to be monitored

In order for the notation **MON-SHAFT (Y)** to be granted, the lubricating oil of the stern bearing is to be analysed as indicated in this Section.

2.2.2 Timing

Stern bearing lubricating oil is to be analysed regularly; in any event, the interval between two subsequent analyses is not to exceed six months.

2.2.3 Records

The lubricating oil analysis documentation is to be available on board showing in particular the trend of the parameters measured according to [2.2.4].

2.2.4 Content of analysis

Each analysis is to include the following parameters:

- water content
- chloride content
- bearing material and metal particle content
- oil ageing (resistance to oxidation).

The oil samples are to be taken under service conditions and are to be representative of the oil within the sterntube.

2.2.5 Additional data to be recorded

In addition to the results of the oil sample analysis, the following data are to be regularly recorded:

- oil consumption
- bearing temperatures (a temperature sensor for each bearing or other approved arrangements are to be provided).

APPENDIX 1 OPTIONAL REQUIREMENTS (NOT MANDATORY FOR THE ASSIGNMENT OF THE GREEN STAR (Y) ADDITIONAL CLASS NOTATION)

1 Application

1.1

1.1.1 The requirements of this Appendix 1 are additional to those listed in Pt. F, Ch1, Sec.2 and are note mandatory for the assignment of the **GREEN STAR (Y)** additional Class notation.

The requirements of this Appendix can be applied on a voluntary basis in order to improve the environmental/comfort performances of the yacht.

2 Design requirements

2.1 Fuel tanks

2.1.1 Fuel tanks overflow and venting pipes should be provided with coal filters of suitable size and characteristics. Alternatives filters like bio-filters may be used.

2.2 Bilge water pre-separation tank

2.2.1 The following design requirements are suggested for the design of the bilge water pre-separation tank:

- the bilge pre-separation tank should have an inclined bottom to facilitate sedimentation and the clean of solids;
- bulkheads, transversal to the flow of oily water, should facilitate the separation of oil and water;
- the inlet and outlet of the tank should be fitted on opposite sides of the tank;
- the outlet of the tank should be fitted at almost 1/3rd of the tank height from the bottom in order to prevent the suck up of oil or sediments.

2.3 Black/Grey waters system

2.3.1 The following design requirements are suggested both for the design of the black waters and grey waters systems installed on board:

- the pumps, the piping, the discharge connection for disposal ashore, venting and overflow pipes should be independent from all other systems of the yacht;
- inlets to the mainline should be provided with suitable siphons in order to prevent the backflow of gases in rooms;
- tanks, pumps and valves of the black/grey waters system should be clearly marked in order to distinguish them from other on board systems;
- tanks should to be provided with suitable openings for cleaning;
- venting and overflow pipes from tanks should be provided with coal filters of suitable size and characteristics. Alternatives filters like bio-filters or ozonization may be used.

2.4 Galley funnel

2.4.1 The funnel of the galley should be provided with coal filters of suitable size and characteristics. Alternatives filters like bio-filters or ozonization may be used.

3 Operative requirements

3.1 Oil water separator

3.1.1 In order to better verify the efficiency of the oil water separator it is suggested to carry out at least every 12 months an analysis of samples taken from the influent and from the effluent of the oil water separator. The percentage of oil should be tested in order to verify the real reduction of oil.