

**RULES
FOR THE CLASSIFICATION OF
SHIPS**

*Part 9 – MACHINES
July 2022*

*Amendments No. 4
July 2024*

CROATIAN REGISTER OF SHIPPING

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By the decision of the General Committee of Croatian Register of Shipping,

Amendments No. 4 to the
RULES FOR THE CLASSIFICATION OF SHIPS
Part 9 – MACHINES

have been adopted on 21st June 2024 and shall enter into force on 1st July 2024

GENERAL TERMS AND CONDITIONS

(March 2022)

Article 1 GENERAL

1.1 CROATIAN REGISTER OF SHIPPING (hereinafter: the *Register*) shall at all times remain an independent contractor and neither the *Register* nor any of its officers, surveyors, auditors, inspectors, agents, appointers, officers or managers shall act as an employee, servant or agent of any other party in the performance of the Services rendered by the *Register*.

1.2 The *Register* acts as a service provider. The Services provided by the *Register* cannot be construed as a commitment by the *Register* to achieve any result or as a warranty.

1.3 The provision of Services is subject to these General Terms and Conditions. No other terms and conditions shall apply, either expressly or by implication, unless expressly agreed in writing between the Parties.

1.4 These General Terms and Conditions shall be incorporated into, or referred to in any Contract and shall prevail over and exclude any other terms and conditions that the Client may wish to impose.

Any amendments to and/or deviations from these General Terms and Conditions, as well as any additional terms and conditions of the Client, shall be binding or valid only if set forth in writing and duly signed by the authorised representatives of both Parties.

1.5 The invalidity of one or more provisions of these General Terms and Conditions shall not affect the remaining provisions.

1.6 The Client acknowledges that the latest version of these General terms and Conditions and the latest version of applicable Rules apply to the Services provided by the *Register*.

1.7 Definitions in these General Terms and Conditions take precedence over other definitions that may appear in other documents issued by the *Register*.

1.8 The Client should at all times be aware of the provisions of these General Terms and Conditions, as they may be further amended, with their latest up to date version available on the web site of the *Register*.

Article 2 DEFINITIONS

2.1 **Certificate** means either a class certificate or statutory certificate, statement, attestation, statement of compliance, and a report following the Services provided by the *Register*.

2.2 **Certification** means the activity of certification in application of international and national standards and international industry practice provided by the *Register*.

Certification is an appraisal given by the *Register* to the Client and cannot be construed as an implied or express warranty of safety, fitness for purpose, seaworthiness of the vessel or its value for sale, insurance or chartering.

The purpose of Certification is to provide classification and statutory services and assistance to the maritime industry, Flag State Administrations, and regulatory authorities relating to maritime safety and pollution prevention.

2.3 **Classification** includes all activities and Services provided by the *Register* in accordance with the Rules. Classification may or may not be accompanied by the issuance of a Certificate of class with reference to the Rules.

Certificate of class is valid only if issued by the *Register*.

However, Certificate of class should not be construed as a guarantee of the safety, fitness for purpose or seaworthiness of the vessel. It is merely an attestation that the vessel complies with the Rules developed and published by the *Register*.

In addition, the *Register* is not a guarantee of the safety of life or property at sea or the seaworthiness of a vessel because, although the classification of a vessel is based on the assumption that the vessel will be properly loaded, operated, and maintained by competent and qualified personnel, the *Register* has no control over how a vessel is operated and maintained between the periodic surveys it conducts.

2.4 **Statutory certification** means certification made by the *Register* on behalf of the Flag State Administrations when and to the extent that the *Register* has been authorised to do so by the respective Flag State.

Statutory certification and services include the assessment of vessels registered by the Flag State and/or ship management companies to determine whether such ships/companies comply with the applicable requirements of international conventions, codes and national legislation, and the issuance of, or assistance in the issuance of, the appropriate certificates and documents.

Statutory certification includes, but is not limited to, certification, survey, and issuance of statutory certificates on behalf of the Flag State.

In cases where the *Register* acts on behalf of Flag State Administrations, the *Register* shall follow guidance issued by IMO (Resolutions, Circulars, etc.) or by IACS through Unified Interpretations (UI), unless otherwise directed by the Flag State.

2.5 **Client** means the shipowner, company, shipyard and/or party requesting Services or taking ownership of a classed vessel. In cases where shipowners have authorized another party to operate the vessel on their behalf, that party shall be considered as the company.

In addition to the above the Client means the person and/or entity that has requested Services from the *Register* and that has entered into a Contract or an agreement for Services with the *Register*.

2.6 **Parties** means the *Register* and Client together.

2.7 **Party** means the *Register* or the Client.

2.8 **Contract** means the contract in the form of a written agreement between the Client and the *Register* requesting Services, including these General Terms and Conditions and the Rules.

The provisions related to the Contract in these General Terms and Conditions shall apply even if there is no written agreement between the Client and the *Register*.

The Client may request the *Register* in writing to make a change to the contracted Services. However, the *Register* shall not be obligated to accept or execute any such change until a written agreement has been signed with the Client regarding the compensation and the possible impact of the change on the schedule as an addendum to the originally contracted Services.

2.9 **Services** shall mean the services specified in 2.2, 2.3 and 2.4, but also other services related to certification, classification and statutory certification, such as, but not limited to: ISM Code certification, ISPS Code, MLC 2006 certification, fuel oil consumption reporting, IHM certification, approval of manufacturers and service providers, certification of materials and products, training activities, conformity assessment, and any other relevant activities such as third party inspections, testing, shore and shipboard trials.

The Services provided by the *Register* are performed on a random basis and in no case include a full inspection of all items.

The *Register* shall provide the Services in accordance with related Contract(s), the provisions of these General Terms and Conditions, Rules, the international and national standards, the international conventions, the EU Regulations, the Flag State requirements and the industry practices applicable to the particular Service and always assuming that the Client is aware of these standards and the industry practices.

When providing Services, the *Register* does not guarantee the accuracy of the information or advice provided.

In providing Services, the *Register* does not assess compliance with standards other than the Rules, international and national standards, international conventions, EU regulations, Flag State requirements and industry practice, to the extent agreed in writing or specified in the Contract.

2.10 The *Register* means the Croatian Register of Shipping, an entity organized and existing under Croatian law, which, according to the Law on the Croatian Register of Shipping (Official Gazette No. 1996/81, 2013/76 and 2020/62) and the Charter of the *Register*, is an independent, not-for-profit, but public welfare oriented, public foundation that performs tasks:

- classification of sea-going ships,
- statutory certification of sea-going ships on behalf of the Flag State Administrations,
- classification of inland navigation vessels,
- statutory certification of inland navigation vessels,
- statutory certification of recreational crafts,
- certification of materials and products,
- conformity assessment of recreational crafts,
- conformity assessment of marine equipment,
- conformity assessment of pressure vessels,
- certification/registration of quality management systems.

2.11 **Vessel** means a ship, vessel, unit or offshore structure of any kind, whether or not connected to the shore or sea/river bed, located at sea or in inland waters and intended for transportation or special operations on the water, as decided by the *Register*.

2.12 **Rules** means the Rules for the classification, guidelines, instructions, or other documented evidence of the *Register* related to the Services provided.

The competent interpretation of the requirements specified in the Rules or other regulations published by the *Register* shall be the exclusive responsibility of the *Register's* Head Office, notwithstanding any possible different interpretations by other parties.

In cases where the Rules do not contain detailed requirements, the specific approval by the *Register* shall be based on the principles of the Rules and shall ensure a safety standard equivalent to that of the Rules.

Article 3 RESPONSIBILITIES

3.1 It is the Client's responsibility to ensure that all surveys required for vessel's class maintenance are conducted in a timely manner and in accordance with the Rules.

3.2 The *Register* may suspend or withdraw the vessel's existing Certificate of class in the event of serious deficiencies and replace it with a new Certificate of class with a shortened period of validity during which the deficiencies are to be rectified.

In addition, the *Register* shall suspend or withdraw a vessel's Certificate of class if the deficiencies are of such a magnitude as to endanger the class of the vessel, its safety and integrity, the safety of the crew, passengers, or the marine environment, and shall require that the vessel is to be inspected at the first port of call where the necessary repairs are to be carried out.

3.3 The Client should inform the *Register*:

- (i) in the event of a change in the intended use of a vessel, a conversion and alteration of the hull, machinery installations and other equipment affecting the Class of the vessel assigned by the *Register*. Conversions and alterations must be made under the supervision of the *Register* and must comply with the requirements of the Rules and/or additional requirements of the *Register*,
- (ii) in cases where the vessel has been damaged to such an extent that the Class of the vessel is likely to be affected and the safety and integrity of the vessel is likely to be compromised. In such cases, the vessel must be surveyed at the first port of call or as further directed by the *Register*. The survey shall be to the extent deemed necessary by the *Register*, by taking into account the extent of the damage.
- (iii) in cases where class-related deficiencies and/or defects are found as a result of a Flag State inspection or Port State Control. Should the Client fail to notify the *Register* of the detention of the vessel by Port State Authorities due to class related deficiencies, the *Register* reserves the right to suspend or withdraw the Certificate of class.

3.4 The *Register* shall have full control over Certificates issued and may suspend or withdraw a Certificate at any time in its sole discretion if the Client fails to comply with the following requirements set forth in the *Rules for the Classification of Ships, Part 1 - General Requirements, Chapter 1 - General Information*, as applicable:

- (i) para. 5.3 - *Maintenance of the validity of Certificate of Class*,
- (ii) para. 5.4 - *Period of Validity*,
- (iii) para. 5.5 - *Extension of the Period of Validity*,
- (iv) para. 5.6 - *Suspension and Reinstatement of Class in the Case of Overdue Surveys*, and
- (v) para. 5.7 - *Withdrawal of Class*.

3.5 The *Register* may suspend or withdraw a Certificate at any time in its sole discretion if the Client fails to comply with the following requirements set forth in the *Rules for the Classification of Inland Navigation Vessels, Part 1 - Classification and Surveys, Chapter I - Principles of Classification*, as applicable:

- (i) para. 2.8 - *Maintenance of the Validity of the Certificate of Class*,
 - (ii) para. 2.9 - *Extension of validity of the Certificate of Class*,
- and following requirements set forth in the *Rules for the Classification of Inland Navigation Vessels, Part 1 - Classification and Surveys, Chapter II - Classification*, as applicable:

- (iii) para. 2.1 - *Suspension of Class*,
- (iv) para. 2.2 - *Withdrawal of Class*.

3.6 In addition to clauses 3.2, 3.4 and 3.5 of this Article, the *Register* reserves the right to terminate the Services and related Contract in the event of a breach of the provisions of these General Terms and Conditions.

3.7 If the Client fails to provide the *Register* with the required access or information at the agreed times or fails to prepare for the Service in a timely manner, the *Register* may suspend the provision of the Service until it receives the Client's instructions for access and/or the required information.

The *Register* shall not be liable for the consequences of such suspension, and the Client shall be responsible for the *Register's* additional fees and other unnecessary costs and expenses incurred by the *Register*.

3.8 The Client is obliged to perform timely payments of the invoices for provided Services. However, the *Register* may retain or withhold any Service or Certificate to the Client in the case of outstanding payments, whether mutually related or not, arising out of the entire business relationship with the Client.

Article 4 HEALTH, SAFETY AND ENVIRONMENT

4.1 Both the *Register* and the Client shall apply reasonable standards to promote safety, health, and environmental protection and to provide a safe working environment for their personnel.

4.2 The Client shall provide the *Register* with all access and information necessary for the safe and efficient performance of the requested Services as required by the Rules.

4.3 During the survey, personnel of the *Register* should have secure access to all work that directly or indirectly affects the Service.

4.4 The *Register* has the right to refuse to conduct an activity or visit an area or site if the *Register* in its sole discretion, believes that relevant risks are unacceptable or are not adequately addressed, contained, or otherwise mitigated.

Such a decision shall suspend the obligations of both Parties under the Contract without incurring any liability or penalty until the Parties agree on how to proceed.

Article 5 THIRD PARTIES AND SUBCONTRACTORS

5.1 Each specific Contract, including any Certificates issued, relates specifically to the Client, and no rights, obligations, interests, claims, benefits or Certificates issued shall extend to any third party without the prior written consent of the *Register*.

5.2 The Client shall not be entitled to grant any right to use the Certificates to any third party without the prior written consent of the *Register*.

5.3 The Client shall not without *Register's* consent, cede, assign, transfer, subcontract or deal in any manner with all or any of its rights or obligations under any Service and related Contract.

5.4 With regard to third party rights to access information and Certificates under confidentiality clause reference is to be made to Article 9.

Article 6 TAXES

6.1 Each Party shall be responsible for and shall bear all taxes, duties or similar governmental charges levied or imposed on any activity of that Party.

6.2 Prices, fees, rates, or remuneration are exclusive of any form of sales tax, value added tax, administrative fees and services tax and/or other similar taxes, including any surcharges. If any such indirect tax is or becomes applicable to the Services provided under the Contract, the Client shall be responsible for the payment of such indirect taxes.

Article 7 PAYMENT OF INVOICES

7.1 The provision of Services by the *Register*, whether complete or not, shall include payment of fees thirty (30) days after issuance of the invoice for the portion of the Services performed.

7.2 In the event that the Client fails to meet the requirements for payment in accordance with the instalments and terms of payment contained herein, the *Register* reserves the right to charge the Client with the interest rate in accordance with the applicable laws of the Republic of Croatia.

7.3 If the Client disputes an invoice or part of an invoice, the Client shall notify *Register* thereof in writing without undue delay. If no notification is received by the due date, Client shall be deemed to have accepted the invoice in full. If only part of an invoice is disputed, the undisputed amount must be paid by the due date.

Consequently, no disputes arising between the *Register* and the Client shall interfere with prompt payment of invoices by the Client. Any rights of lien or retention in favour of the Client or otherwise, are hereby excluded.

7.4 In the event of cancellation of all or part of the Services prior to their final completion, the Client shall pay all costs incurred by the *Register* on pro-rata basis for the portion of the Services provided to date. In such event, the *Register* will not claim the Client for loss of profit or reduced income. All reasonable costs directly attributable to the early termination and all amounts due to the *Register* at that time shall become immediately due and payable.

7.5 In the event of termination of the Service and related Contract, the *Register* shall be entitled to retain any payments, deposits or prepayments of fees made by the Client prior to the date of termination up to the amount to which the *Register* is entitled.

Article 8 TERMINATION

8.1 The Parties shall have the right to terminate the Services and the related Contract(s) by written notice to the other Party, and without prejudice to Article 7, in the following cases:

- (i) if the other Party commits a material breach of these General Terms and Conditions and/or the Contract and fails to rectify such breach in accordance with clause 8.4 of this Article,
- (ii) if the other Party becomes insolvent, is unable to pay its debts as they become due, or becomes subject to bankruptcy proceedings, administration, receivership, dissolution, liquidation, winding up or otherwise ceases to carry on its business; or
- (iii) for convenience, after giving the other Party thirty (30) days' prior written notice of termination.

8.2 The Classification issued for the relevant vessel and the Certificates previously issued shall remain valid until the effective date of termination or, in the event of such termination, immediately, subject to compliance with Article 3 and Article 7.

8.3 If, in the reasonable opinion of the *Register*, the Client breaches or is suspected of breaching Article 14 or Article 15, the *Register* shall have the right to terminate the Service and related Contract with immediate effect.

8.4 Notwithstanding the provisions of clause 8.1 of this Article, the Party intending to terminate Services for non-compliance or breach of the provisions of these General Terms and Conditions shall notify the other Party of the non-compliance or violation of the provisions of these General Terms and Conditions and set a reasonable deadline of 15 (fifteen) days for the other Party to remedy the breaches of the provisions of these General Terms and Conditions.

If the Party fails to remedy the breaches of the provisions of these General Terms and Conditions within the aforementioned period, the other Party shall have the right to terminate Services without further notice.

8.5 Termination of the Service and related Contract pursuant to the provisions of these General Terms and Conditions shall not give either Party the right to claim any additional compensation, indemnity or reimbursement from the other Party as a result of such termination, but such termination shall not affect any rights or remedies available to a Party at the time the termination becomes effective or any obligations or liabilities incurred by a Party.

Article 9 CONFIDENTIALITY

9.1 The Parties agree to keep confidential all facts, data, information, etc. related to the other Party's business that they have learned in the course of providing Services. Such information and data shall not be disclosed by the Parties to any third party and shall not be used or misused to the detriment of the other Party.

9.2 The *Register* will keep confidential any data, plans or other technical information received from the Client and will not disclose it to any third party outside the *Register*, unless authorised by the Client. This obligation shall continue to apply after termination of the Services. This obligation shall not apply to any data, plans or other technical information that was in the possession of the *Register* prior to being disclosed to the *Register* by or on behalf of the Client, or that becomes publicly available through no fault of the *Register*, or is otherwise provided to the *Register* by an independent source that is under no obligation of confidentiality to the *Register*.

9.3 Certificates issued by the *Register* to the Client as a result of the Services provided shall not be covered by the confidentiality Article.

Notwithstanding the foregoing, the Client shall be entitled to disclose any data to its affiliates involved in the transactions related to the Services or the Client's core activities.

9.4 Notwithstanding clause 9.1 and clause 9.2 of this Article, the *Register* shall have the right to disclose the Confidential Information to the following parties if required by regulations of:

- (i) authorised representatives of the Flag State Administration,
- (ii) authorised audit teams (i.e., accreditation body or EC auditors),
- (iii) the International Association of Classification Societies (IACS),
- (iv) a court of competent jurisdiction, government agency, or other relevant public authority, in accordance with applicable law, court order, or other public regulation.

9.5 The Client acknowledges that the *Register* is required to provide access to information to the EU Commission or any person acting on its behalf in accordance with applicable EU requirements and that the Client shall give the EU Commission with unrestricted access to the vessels for the purpose of inspection.

9.6 The obligations in this Article shall survive the conclusion of the Service or the termination of related Contract and shall continue for as long as the relevant information remains confidential.

Article 10 INTELLECTUAL PROPERTY

10.1 Each Party shall be the sole owner of all rights to its Intellectual Property created before or after the effective date of these General Terms and Conditions, whether or not associated with any Contract between the Parties.

10.2 The Intellectual Property developed by the *Register* for the provision of the Services, including but not limited to drawings, calculations and reports, shall remain the exclusive property of the *Register*.

Article 11 PROFESSIONAL ETHICS

11.1 Each of the Parties warrants that, with respect to the matters contemplated herein, neither it nor its affiliates has made or will make, directly or indirectly, any offer, payment, gift or authorization of money to any government official or employee, political party, public official or candidate for the benefit or advantage thereof.

11.2 In providing the Services, the *Register* shall strictly adhere to the requirements of its Code of Ethics relating to business activities.

Article 12 FORCE MAJEURE

12.1 For the purposes of these General Terms and Conditions, the term "Force Majeure" includes any event that directly or indirectly prevents the Parties from fulfilling their obligations due to events beyond their control, such as: strikes, wars, riots, piracy, civil commotion, malicious damage, pandemic, compliance with laws or government orders, rules, regulations or directives, sanctions and embargoes, accidents, defects of plants or machinery, seizures, fires, floods, storms and the like.

12.2 If either Party is prevented or delayed from performing its obligations by Force Majeure, such Party shall promptly notify the other Party in writing of the circumstances of the Force Majeure and its influence and, after such notification, shall not be liable for performance of any obligations prevented by the influence of the Force Majeure during its duration. Upon termination of the influence of the Force Majeure, the same Party should proceed with the planned activities in order to fulfil its obligations.

12.3 If one of the Parties is prevented by Force Majeure in its activities and fulfilment of its obligations and this event lasts continuously for three (3) months, the other Party shall be entitled to terminate the Service and related Contract without liability.

12.4 Neither of the Parties shall be liable for non-compliance with these General Terms and Conditions due to Force Majeure. If one of the Parties is prevented from fulfilling its obligations under these General Terms and Conditions due to Force Majeure, it shall immediately notify the other Party in writing within a reasonable period of time, stating the reasons for the Force Majeure and providing relevant evidence, if any.

Article 13 INDEMNIFICATIONS

13.1 Each Party shall indemnify the other Party against all claims arising out of the performance of the Services in respect of bodily injury, illness or death of any of its employees or other representatives and in respect of loss of or damage to the Party's property.

This provision shall apply whether or not the damage is caused or contributed to by the negligence of the other Party. Both Parties are obliged to take out separate insurances for these liabilities.

13.2 The Client shall indemnify the *Register* from and against all claims arising from the Client's violation of the provisions of these General Terms and Conditions and from the misuse of the Certificates issued by the *Register*.

13.3 The Client shall indemnify the *Register* against any financial responsibility or amounts arising from non-payment, late payment or payment of withholding taxes to the non-relevant tax authority or any other relevant governmental body.

13.4 Each Party shall notify the other Party without undue delay as soon as it becomes aware of any incident that could give rise to a claim against the other Party in respect of the Service provided and related Contract.

Article 14 ANTI-CORRUPTION

14.1 Each Party agrees that in performing its obligations under any Service, it will ensure that its affiliates, employees and/or agents, subsidiaries, subcontractors, consultants, and any other persons providing Services will:

- (i) comply with all applicable anti-bribery and anti-corruption laws (collectively, Anti-Bribery Laws) and, in particular, do not, directly or indirectly, offer, promise, grant, authorise the payment of, or confer any financial or other benefit on any public or government official:
 - to a public or governmental official to obtain or retain business with the intent to influence such official in his or her capacity as an official, if such official is not permitted or required by written law to be influenced by the offer, promise or gift; or
 - to another person with the intent to induce or reward the improper performance of a function or activity or for any other illegal purpose,
- (ii) maintain adequate systems and procedures designed to prevent activities, practises, or conduct in connection with services that would constitute an offence under an anticorruption law; and
- (iii) take reasonable steps to prevent similar acts by customers, contractors, subcontractors, agents and other third parties, persons under its control or influence.

14.2 Any failure by a Party to comply with or ensure compliance with its obligations under this Article shall, notwithstanding anything to the contrary in these General Terms and Conditions, be deemed a breach of these General Terms and Conditions which shall entitle the other Party to suspend and/or terminate the Services by notice in writing with immediate effect without further liability to the other Party except for any liability which may have arisen prior to the date of termination or suspension (as the case may be).

14.3 If a Party elects to suspend the provision of Services under these General Terms and Conditions pursuant to this Article, it shall have the sole and absolute discretion to determine:

- (i) when it will resume performance (if at all); and
- (ii) extend the period for performance of its obligations under the Services in its sole discretion.

Article 15 SANCTIONS

15.1 Each Party shall conduct all activities in compliance with all laws, statutes, rules, economic and trade sanctions (including, but not limited to, U.S. sanctions and EU sanctions) and regulations applicable to such Party, including, but not limited to: child labour, forced labour, collective bargaining, discrimination, abuse, working hours and minimum wages, anti-bribery, anti-corruption, copyright and trademark protection, personal data protection.

15.2 Each Party hereby represents and warrants that it is not or will not be subject to any economic or trade sanctions ("Sanctions") imposed by the United States of America, the European Union, the United Kingdom, any EU Member State, or the United Nations with respect to any country and/or by any sanction giver with respect to any company/individual.

15.3 Each Party represents and warrants that it will strictly comply with all Sanctions.

15.4 Nothing in these General Terms and Conditions shall be construed as causing or obligating either Party to act or refrain from acting in a manner inconsistent with, punishable by, or prohibited by any Sanctions.

15.5 Neither Party shall be obligated to perform any obligation arising under these Terms and Conditions (including, without limitation, the obligation to):

- (i) perform, deliver, accept, sell, purchase, pay or receive any funds to, from or through any person or entity; or
- (ii) engage in any other action whatsoever,
if doing so violates or is inconsistent with sanctions and/or recommendations of international (intergovernmental) organisations to combat the financing of terrorism and other criminal activities and/or money laundering or exposes such Party to investigation or penalties.

15.6 In the event that a Party breaches any Sanctions or the Party's Business and/or Transactions arising out of or in connection with these General Terms and Conditions breach any Sanctions or otherwise violate the recommendations of one or more international (intergovernmental) organisations for combating the financing of terrorism and other criminal activities and/or money laundering, the other Party shall be entitled to terminate these General Terms and Conditions by written notice with immediate effect without incurring any liability to the other Party, except for liabilities (if any) incurred prior to the date of termination.

Article 16 LIABILITY

16.1 The *Register* is not, and cannot be considered as, an underwriter, consulting engineer, naval architect, shipbuilder, shipowner, or ship management company, nor can it assume the obligations and responsibilities associated with such functions, although the *Register's* experience may enable it to respond to inquiries about matters not covered by its Rules, policies, instructions, or other documented evidence.

16.2 The practices and procedures of the *Register* shall be selected by the *Register* in its sole and absolute discretion based on its experience and knowledge and in accordance with generally accepted professional standards in the relevant field of classification societies.

16.3 Nothing herein contained shall release any designer, naval architect or engineer, shipbuilder or manufacturer, shipyard, vendor, supplier, contractor or subcontractor, repairer or owner, from any information, report, certificate or similar document issued in connection with the provision of Services by the *Register*, operator, manager or other person or entity from any express or implied warranty or other contractual obligation or responsibility, or from any negligent act, error or omission of any kind whatsoever, nor shall they create any right, claim or benefit for any third party.

16.4 The *Register* shall exercise due care in the selection or appointment of its surveyors and all other employees whose presence and work is necessary for the provision of the Services.

16.5 If any person or entity using the Services of the *Register* suffers any loss, damage or expense that is or is shown to have been caused by a negligent act, omission or error of the *Register's* officers, surveyors, auditors, inspectors, agents, appointees, officers or managers, or those purporting to act in the name of and on behalf of the *Register*, or a negligent inaccuracy, advice, report or evidence given by or in the name of or/and on behalf of the *Register*, then the liability of the *Register* is limited in respect of any direct or indirect claim shall be limited to an amount not exceeding five times the fee charged or to be charged by the *Register* for the relevant Service.

16.6 Any liability for consequential damages is expressly excluded.

For purposes of this clause, consequential damages include, without limitation:

- (i) indirect or consequential damages,

- (ii) loss and/or delay of production, loss of products, loss of use, loss of bargain, loss of revenue, loss of profit or anticipated profit, loss of business and business interruption, in each case directly or indirectly.

16.7 The Parties are not entitled to assign the performance of obligations under these General Terms and Conditions or parts thereof to third parties without the prior written consent of the other Party.

16.8 If during the term of the Contract, there is a transfer of function due to change of status (merger, acquisition, division, etc.), all obligations and rights under these General Terms and Conditions and associated Contract will be transferred to the legal successor of the Party concerned.

Article 17 GOVERNING LAW AND RESOLVING OF DISPUTES

17.1 These General Terms and Conditions and any dispute or claim between the Parties arising from or in connection with it, or the Services provided hereunder, will be governed and interpreted in accordance with the English law.

17.2 The Parties shall use their reasonable efforts to resolve any claim or dispute arising in relation to rendered Service by negotiations within a reasonable time.

17.3 Should the Parties fail to resolve any claim or dispute by negotiations, the dispute shall be exclusively subject to the jurisdiction of the Permanent Arbitration Court with the Croatian Chamber of Economy in Zagreb, Republic of Croatia.

17.4 The Parties agree to keep the any arbitration proceedings confidential.

17.5 Notwithstanding the above, any claim not presented within three (3) months of the completion of the particular Services, or within three (3) months of from the date when the events which are relied on were first discovered by the Client, shall be deemed waived and absolutely time barred.

17.6 Any objections against the line adopted by any of the *Register's* servants in fulfilling their duties or against the conclusions reached are to be raised to the *Register* by the Party as soon as possible.

If the Party is not satisfied with the final conclusions and interpretations by the *Register* the arbitration lays upon the Commission for appeal for Classification and Statutory certification of ships, which is to be formed according to the Regulation 39 of the Charter of the *Register*.

INTRODUCTORY NOTES

These amendments shall be read together with the requirements in the Rules for the Classification of Ships, Part 9 – Machines, edition July 2022, as last amended by Amendments No. 3, edition January 2024.

Table 1 contains review of amendments, where items changed or added in relating to previous edition are given, with short description of each modification or addition. All major changes throughout the text are shaded.

This Part of the Rules includes the requirements of the following international Organisations:

International Maritime Organization (IMO)

Conventions: International Convention for the Safety of Life at Sea, 1974 (SOLAS 74) and all subsequent and applicable amendments adopted up to MSC 106
 Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS PROT 1988)

International Convention for the Prevention of Pollution from Ships 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and all subsequent and applicable amendments adopted up to MEPC 80
 Protocol of 1997 to amend the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto

Circulars: MSC.1/Circ.1425

International Association of Classification Societies (IACS)

Unified Requirements (UR): A3 (Rev.1 2019), F29 (Rev. 6, 2005), M2 (1971), M3 (Rev. 6, 2018), M9 (Corr. 2, 2007), M10 (Rev. 4, 2013), M11 (1972), M12 (1972), M16 (Rev. 1, 2005), M26 (Corr. 1, 2005), M28 (1978), M42 (Rev.6, Mar 2022), M44 (Corr. 1, Feb 2022), M51 (Corr. 1, Oct 2018), M53 (Rev. 5, May 2023), M56 (Corr.2, Mar 2023), M60 (Rev.1, Nov 2021), M61 (Rev.1, Feb 2022), M63 (Rev.1, Jan 2023), M66 (Corr. 1, Oct 2021), M67 (Rev. 2, 2015), M71 (Corr.1, 2016), M72 (Rev.23 Apr 2023), M73 (Rev.2, May 2023), M74 (Rev. 2, June 2021), Z26 (2015), M77 (Rev. 4, Feb 2023), M79 (Rev. 1, Feb 2020), M80 (2019), M81 (Rev.1, July 2023)

Unified Interpretations: SC76 (1985), SC94 (Rev. 2, 2016), SC133 (1998), SC189 (2004), SC228 (2008), SC242 (Rev.2, 2020), SC246 (Rev.1, 2015)

International Organisation for Standardisation:

ISO 1122-1:1998 Corr. 1:1999 Corr. 2:2009, ISO 1328-1:2013, ISO 1328-2:2020, ISO 6336-1:2019, ISO 6336-2:2019, ISO 6336-3:2019, ISO 6336-5:2016, ISO 19019:2005

TABLE 1 – REVIEW OF AMENDMENTS

This review comprises amendments in relation to the Rules for the Classification of Ships, Part 9 – Machines, edition July 2022, as last amended by Amendments No. 3, edition January 2024.

<i>ITEM</i>	<i>DESCRIPTION OF THE AMENDMENTS</i>
SECTION 1 - GENERAL	
Head 1.7 CERTIFICATION OF INTERNAL COMBUSTION ENGINE COMPONENTS	Existing Head 1.7 has been amended in order to include requirements contained in revised IACS UR M72, Rev.3, July 2023. Changes in Table 1.7.2.1,
SECTION 2 – INTERNAL COMBUSTION ENGINES	
Head 2.2 - TURBOCHARGERS	Existing Head 2.2 has been amended in order to include requirements contained in revised IACS UR M73, Rev.2, May 2023. Changes in item 2.202.1.1, item 2.20.3.2.4, item 2.20.3.2.5, item 2.20.3.4.3, 2.20.4.4. New items 2.20.3.2.6 and 2.20.3.2.7 added.
ANNEX C - SAFETY MEASURES AGAINST CHEMICAL TREATMENT FLUIDS USED FOR EXHAUST GAS CLEANING SYSTEMS AND THE RESIDUES WHICH HAVE HAZARDOUS PROPERTIES	
Annex C	Existing Annex C has been amended to in order include requirements contained in revised IACS UR M81, Rev.1, July 2023. Changes in item 2.3, item 2.4, item 2.10 and item 2.16
Annex C	New Head 3 - Requirement for exhaust gas cleaning systems discharge water pipeline has been added to in order include requirements contained in revised IACS UR M81, Rev.1, July 2023.
Annex C	Existing Head 3 – Miscellaneous renumbered as Head 4.

1 GENERAL

■ **Head 1.7 – CERTIFICATION OF INTERNAL COMBUSTION ENGINE COMPONENTS** has been changed and should be read as follows:

1.7 CERTIFICATION OF INTERNAL COMBUSTION ENGINE COMPONENTS

1.7.1 General

The engine manufacturer is to have a quality control system that is suitable for the actual engine types to be certified by the *Register*. The quality control system is also to apply to any sub-suppliers. The *Register* reserves the right to review the system or parts thereof. Materials and components are to be produced in compliance with all the applicable production and quality instructions specified by the engine manufacturer. The *Register* requires that certain parts are verified and documented by means of Register Certificate (RC), Work Certificate (W) or Test Report (TR).

1.7.1.1 *Register* Certificate (RC): this is a document issued by the *Register* stating:

- conformity with Rules requirements.
- that the tests and inspections have been carried out on:
 - the finished certified component itself; or
 - on samples taken from earlier stages in the production of the component, when applicable.
- that the inspection and tests were performed in the presence of the Surveyor or in accordance with special agreements, i.e. Alternative Certification Scheme (ACS).

1.7.1.2 Work's Certificate (W): this is a document signed by the manufacturer stating:

- conformity with requirements.
- that the tests and inspections have been carried out on:
 - the finished certified component itself; or
 - on samples taken from earlier stages in the production of the component, when applicable.
- that the tests were witnessed and signed by a qualified representative of the applicable department of the manufacturer.

A Work's Certificate may be considered equivalent to a *Register* Certificate and endorsed by the *Register* if:

- the test was witnessed by the *Register* Surveyor; or
- an Alternative Certification Scheme (ACS) agreement is in place between the *Register* and the manufacturer or material supplier; or
- the Work's certificate is supported by tests carried out by an accredited third party that is accepted by the *Register* and independent from the manufacturer and/or material supplier.

1.7.1.3 Test Report (TR): this is a document signed by the manufacturer stating:

- conformity with requirements;
- that the tests and inspections have been carried out on samples from the current production batch.

The documents above are used for product documentation as well as for documentation of single inspections such as crack detection, dimensional check, etc. If agreed to by the *Register*, the documentation of single tests and inspections may also be arranged by filling in results on a control sheet following the component through the production.

The Surveyor is to review the TR and W for compliance with the agreed or approved specifications. RC means that the Surveyor also witnesses the testing, batch or individual, unless an Alternative Certification Scheme (ACS) provides other arrangements.

The manufacturer is not exempted from responsibility for any relevant tests and inspections of those parts for which documentation is not explicitly requested by the *Register*.

The manufacturing process and equipment is to be set up and maintained in such a way that all materials and components can be consistently produced to the required standard. This includes production and assembly lines, machining units, special tools and devices, assembly and testing rigs as well as all lifting and transportation devices.

1.7.2 Parts to be documented

1.7.2.1 The extent of parts to be documented depends on the type of engine, engine size and criticality of the part. A summary of the required documentation for the engine components is listed in Table 1.7.2.1

1.7.2.2 For components and materials not specified in Table 1.7.2.1, consideration will be given by the *Register* upon full details being submitted and reviewed.

Table 1.7.2.1
Summary of required documentation for engine components

Part ^{4), 5), 6), 7), 8)}	Material properties ¹⁾	Non-destructive examination ²⁾	Hydraulic testing ³⁾	Dimensional inspection, including surface condition	Visual inspection (surveyor)	Applicable to engines:	Component certificate
Welded bedplate	W(C+M)	W(UT+CD)			fit-up + post-welding	All	RC
Bearing transverse girders GS	W(C+M)	W(UT+CD)			X	All	RC
Welded frame box	W(C+M)	W(UT+CD)			fit-up + post-welding	All	RC
Cylinder block GJL			W ¹⁰⁾			>400 kW/cyl	
Cylinder block GJS			W ¹⁰⁾			>400 kW/cyl	
Welded cylinder frames	W(C+M)	W(UT+CD)			fit-up + post-welding	CH	RC
Engine block GJL			W ¹⁰⁾			>400 kW/cyl	
Engine block GJS	W(M)		W ¹⁰⁾			>400 kW/cyl	
Cylinder liner	W(C+M)		W ¹⁰⁾			D>300mm	
Cylinder head GJL			W			D>300mm	
Cylinder head GJS			W			D>300mm	
Cylinder head GS	W(C+M)	W(UT+CD)	W		X	D>300mm	RC
Forged cylinder head	W(C+M)	W(UT+CD)	W		X	D>300mm	RC
Piston crown GS	W(C+M)	W(UT+CD)			X	D>400mm	RC
Forged piston crown	W(C+M)	W(UT+CD)			X	D>400mm	RC
Crankshaft: made in one piece	SC(C+M)	W(UT+CD)		W	Random, of fillets and oil bores	All	RC
Semi-built Crankshaft (Crankthrow, forged main journal and journals with flange)	SC(C+M)	W(UT+CD)		W	Random, of fillets and shrink fittings	All	RC
Exhaust gas valve cage			W			CH	
Piston rod	SC(C+M)	W(UT+CD)			Random	D>400mm CH	RC
Cross head	SC(C+M)	W(UT+CD)			Random	CH	RC
Connecting rod with cap	SC(C+M)	W(UT+CD)		W	Random, of all surfaces, in particular those shot peened	All	RC
Coupling bolts for crankshaft	SC(C+M)	W(UT+CD)		W	Random, of interference fit	All	RC

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Part 4), 5), 6), 7), 8)	Material properties ¹⁾	Non-destructive examination ²⁾	Hydraulic testing ³⁾	Dimensional inspection, including surface condition	Visual inspection (surveyor)	Applicable to engines:	Component certificate
Bolts and studs for main bearings	W(C+M)	W(UT+CD)				D>300mm	
Bolts and studs for cylinder heads	W(C+M)	W(UT+CD)				D>300mm	
Bolts and studs for connecting rods	W(C+M)	W(UT+CD)		TR of thread making		D>300mm	
Tie rod	W(C+M)	W(UT+CD)		TR of thread making	Random	CH	RC
High pressure fuel injection pump body	W(C+M)		W			D>300mm	
	W(C+M)		TR			D≤300mm	
High pressure fuel injection valves (only for those not auto-fretted)			W			D>300mm	
			TR			D≤300mm	
High pressure fuel injection pipes including common fuel rail	W(C+M)		W for those that are not auto-fretted			D>300mm	
	W(C+M)		TR for those that are not auto-fretted			D≤300mm	
High pressure common servo oil system	W(C+M)		W			D>300mm	
	W(C+M)		TR			D≤300mm	
Cooler, both sides ⁹⁾	W(C+M)		W			D>300mm	
Accumulator	W(C+M)		W			All engines with accumulators with a capacity of >0,5 l	
Piping, pumps, actuators, etc. for hydraulic drive of valves, if applicable	W(C+M)		W			>800 kW/cyl	
Engine driven pumps (oil, water, fuel, bilge) other than pumps high pressure fuel injection pumps and hydraulic drive pumps			W			>800 kW/cyl	
Bearings for main, crosshead, and crankpin	TR(C)	TR (UT for full contact between base material and bearing metal)		W		>800 kW/cyl	

NOTES:

1. Material properties include chemical composition and mechanical properties, and also surface treatment such as surface hardening (hardness, depth and extent), peening and rolling (extent and applied force).
2. Non-destructive examination means e.g., ultrasonic testing, crack detection by MPI or DP. When certain NDE method on the finished component is impractical (for example UT for items Cylinder head GS, Forged cylinder head), the NDE method can be performed at earlier appropriate stages in the production of the component, see item 1.7.1.1.
3. Hydraulic testing is applied on the water/oil side of the component. Items are to be tested by hydraulic pressure at the pressure equal to 1.5 times the maximum working pressure. High pressure parts of the fuel injection system are to be tested by hydraulic pressure at the pressure equal to 1.5 maximum working pressure or maximum working pressure plus 300 bar, whichever is the less. Where design or testing features may require modification of these test requirements, special consideration may be given.
4. Material certification requirements for pumps and piping components are dependent on the operating pressure and temperature. Requirements given in this Table apply except where alternative requirements are explicitly given elsewhere in the IACS URs.
5. For turbochargers, see 2.20.
6. Crankcase explosion relief valves are to be type tested in accordance with IACS UR M66 and documented according to IACS UR M9.
7. Oil mist detection systems are to be type tested in accordance with IACS UR M67 and documented according to IACS UR M10.
8. For speed governor and overspeed protective devices, see IACS UR M3.
9. Charge air coolers need only be tested on the water side.
10. Hydraulic testing is also required for those parts filled with cooling water and having the function of containing the water which is in contact with the cylinder or cylinder liner.
11. Symbols used in Table 1.7.2.1

Symbol	Description
C	chemical composition
CD	crack detection by MPI or DP
CH	crosshead engines
D	cylinder bore diameter (mm)
GJL	grey cast iron
GJS	spheroidal graphite cast iron
GS	cast steel
M	mechanical properties
RC	Register Certificate
TR	test report
UT	ultrasonic testing
W	work certificate
X	visual examination of accessible surfaces by the Surveyor

2 INTERNAL COMBUSTION ENGINES

■ **Head 2.2 – TURBOCHARGERS** has been changed and should be read as follows:

2.20.1 General

2.20.1.1 These requirements are applicable for turbo-chargers with regard to design approval, type testing and certification and their matching on engines.

Turbochargers are to be type approved, either separately or as a part of an engine. The requirements are written for exhaust gas driven turbochargers, but apply in principle also for engine driven chargers.

NOTES:

The requirements of this head, except for item 2.20.4, are to be uniformly implemented to turbochargers with the date of application for certification on or after 1 July 2024. Turbochargers with an existing type approval on 1 July 2024 are not required to be re-type approved in accordance with this head until the current Type Approval reaches its expiry date.

The requirements of item 2.20.4 are to be uniformly implemented to turbochargers with the date of application for certification of an individual turbocharger on or after 1 July 2024.

The “date of application for certification” is the date of whatever document the Register requires/accepts as an application or request for certification of a new turbocharger type or of a turbocharger type that has undergone substantive modifications in respect of the one previously type approved, or for renewal of an expired type approval certificate.

2.20.1.2 The requirements escalate with the size of the turbochargers. The parameter for size is the engine power (at MCR) supplied by a group of cylinders served by the actual turbocharger, (e.g. for a V-engine with one turbocharger for each bank the size is half of the total engine power).

2.20.1.3 Turbochargers are categorised in three groups depending on served power by cylinder groups with:

- Category A: ≤ 1000 kW;
- Category B: > 1000 kW and ≤ 2500 kW;
- Category C: > 2500 kW.

2.20.2 Documentation to be submitted

2.20.2.1 For turbochargers of category A:

- Containment test report;
- Cross sectional drawing with principal dimensions and names of components;
- Test program.

2.20.2.2 For turbochargers of category B and C:

- Cross sectional drawing with principal dimensions and materials of housing components for containment evaluation;
- Documentation of containment in the event of disc fracture, see 2.20.3.2.
- Operational data and limitations as:
 - Maximum permissible operating speed (rpm);
 - Alarm level for overspeed;
 - Maximum permissible exhaust gas temperature before turbine;
 - Alarm level for exhaust gas temperature before turbine;
 - Minimum lubrication oil inlet pressure;
 - Lubrication oil inlet pressure low alarm set point;
 - Maximum lubrication oil outlet temperature;
 - Lubrication oil outlet temperature high alarm set point;
 - Maximum permissible vibration levels, i.e. self- and externally generated vibration;
 - Arrangement of lubrication system, all variants within a range;
 - Type test reports;
 - Test program.

Alarm levels may be equal to permissible limits but shall not be reached when operating the engine at 110% power or at any approved intermittent overload beyond the 110%.

2.20.2.3 For turbochargers of category C:

- Drawings of the housing and rotating parts including details of blade fixing;
- Material specifications (chemical composition and mechanical properties) of all parts mentioned above;
- Welding details and welding procedure of above mentioned parts, if applicable;

- Documentation of safe torque transmission when the disc is connected to the shaft by an interference fit, see 2.20.3.3 (*NOTE: Applicable to two sizes in a generic range of turbochargers*);
- Information on expected lifespan, considering creep, low cycle fatigue and high cycle fatigue;
- Operation and maintenance manuals (*NOTE: Applicable to two sizes in a generic range of turbochargers*).

2.20.3 Design requirements and corresponding type testing

2.20.3.1 General

2.20.3.1.1 The turbochargers shall be designed to operate under conditions stated in the *Rules for the classification of ships, Part 7 - Machinery Installations*, 1.6. The component lifetime and the alarm level for speed shall be based on 45°C air inlet temperature.

2.20.3.1.2 The air inlet of turbochargers shall be fitted with a filter.

2.20.3.2 Containment

2.20.3.2.1 Turbochargers shall fulfil containment in the event of a rotor burst. This means that at a rotor burst no part may penetrate the casing of the turbocharger or escape through the air intake. For documentation purposes (test/calculation), it shall be assumed that the discs disintegrate in the worst possible way.

2.20.3.2.2 For turbochargers of category B and C, containment shall be documented by testing. Fulfilment of this requirement can be awarded to a generic range of turbochargers based on testing of one specific unit. Testing of a large unit is preferred as this is considered conservative for all smaller units in the generic range. In any case, it must be documented (e.g. by calculation) that the selected test unit really is representative for the whole generic range.

NOTE: A generic range means a series of turbocharger which are of the same design, but scaled to each other.

2.20.3.2.3 The minimum test speeds, relative to the maximum permissible operating speed, are:

- For the compressor: 120%;
- For the turbine: 140% or the natural burst speed, whichever is lower.

2.20.3.2.4 Containment tests shall be performed at working temperature a temperature which is not lower than the maximum allowable temperature of the turbocharger to be specified by the manufacturer.

2.20.3.2.5 Manufacturers are to determine whether cases more critical than those defined in item 2.20.3.2.3. and item 2.20.3.2.4 exist with respect to containment safety. Where such a case is identified, evidence of containment safety shall also be provided for that case.

2.20.3.2.6 A numerical analysis (simulation) such as Finite Element Method (FEM) of sufficient containment integrity of the casing based on calculations by means of a simulation model may be accepted in lieu of the practical containment test, provided that:

- The numerical simulation model has been tested and its suitability/accuracy has been proven by direct comparison between calculation results and the practical containment test for a reference application (reference containment test). This test shall be performed at least once by the manufacturer for acceptance of the numerical simulation method in lieu of tests;
- The corresponding numerical simulation for the containment is performed for the same speeds as specified for the containment test;
- Material properties for highspeed deformations are to be applied in the numeric simulation. The correlation between normal properties and the properties at the pertinent deformation speed are to be substantiated;
- The design of the turbocharger regarding geometry and kinematics is to be similar to the turbocharger that was used for the reference containment test. In general, totally new designs will call for a new reference containment test.

2.20.3.2.7 In cases where a totally new design is adopted for a turbocharger for which an application for type approval certification has been requested, new reference containment tests are to be performed.

- Maximum permissible exhaust gas temperature
- Number of bearings
- Number of turbine blades
- Number of turbine wheels and/or compressor wheels
- Direction of inlet air and/or exhaust gas (e.g., axial flow orientation, radial flow orientation)
- Type of the turbocharger drive (e.g., axial turbine type, radial turbine type, mixed flow turbine type)

NOTE:

Totally new design means the principal differences between a new turbocharger and previous ones are related to geometry and kinematics. The turbochargers are to be regarded as having a totally new design if the structure and/or material of the turbocharger casings are changed, or any of, but not limited to, the following items is changed from the previous design.

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2.20.3.3 Disc-shaft shrinkage fit

In cases where the disc is connected to the shaft with interference fit, calculations shall substantiate safe torque transmission during all relevant operating conditions such as maximum speed, maximum torque and maximum temperature gradient combined with minimum shrinkage amount (*NOTE: Applicable to Category C*).

2.20.3.4 Type testing**2.20.3.4.1 Turbocharger type testing is applicable to Categories B and C.**

2.20.3.4.2 The type test for a generic range of turbochargers may be carried out either on an engine (for which the turbocharger is foreseen) or in a test rig.

2.20.3.4.3 Turbochargers for the low, medium, and high-speed engines are to be subjected to at least 500 load cycles at the limits of operation. This test may be waived if the turbocharger together with the engine is subjected to this kind of low cycle testing, see 2.14.

2.20.3.4.4 The suitability of the turbocharger for such kind of operation is to be preliminarily stated by the manufacturer.

2.20.3.4.5 The rotor vibration characteristics shall be measured and recorded in order to identify possible sub-synchronous vibrations and resonances.

2.20.3.4.6 The type test shall be completed by a hot running test at maximum permissible speed combined with maximum permissible temperature for at least one hour. After this test, the turbocharger shall be opened for examination, with focus on possible rubbing and the bearing conditions.

2.20.3.4.7 The extent of the surveyor's presence during the various parts of the type tests is left to the discretion of the *Register*.

2.20.4 Certification

2.20.4.1 The manufacturer shall adhere to a quality system designed to ensure that the designer's specifications are met, and that manufacturing is in accordance with the approved drawings.

2.20.4.2 For category C, this shall be verified by means of periodic product audits of an Alternative Certification Scheme (ACS) by the *Register*.

2.20.4.3 These audits shall focus on:

- Chemical composition of material for the rotating parts;
- Mechanical properties of the material of a representative specimen for the rotating parts and the casing;
- UT and crack detection of rotating parts;
- Dimensional inspection of rotating parts;
- Rotor balancing;
- Hydraulic testing of cooling spaces to 4 bars or 1.5 times maximum working pressure, whichever is higher;
- Overspeed test of all compressor wheels for a duration of 3 minutes at either 20% above alarm level speed at room temperature or 10% above alarm level speed at 45°C inlet temperature when tested in the actual housing with the corresponding pressure ratio. The overspeed test may be waived for forged wheels that are individually controlled by an approved non-destructive method.

2.20.4.4 Turbochargers shall be delivered with:

- For category C, a *Register* Certificate, which as a minimum cites the applicable type approval and the Alternative Certification Scheme (ACS), when ACS applies;
- For category B, a work's certificate, which as a minimum cites the applicable type approval, which includes production assessment.

2.20.4.5 The same applies to replacement of rotating parts and casing.

2.20.4.6 Alternatively to the above periodic product audits, individual certification of a turbocharger and its parts may be made at the discretion of the *Register*. However, such individual certification of category C turbocharger and its parts shall also be based on test requirements specified in the above mentioned bullet points.

2.20.5 Alarms and Monitoring

2.20.5.1 For all turbochargers of Categories B and C, indications and alarms as listed in the table are required.

2.20.5.2 Indications may be provided at either local or remote locations.

Pos.	Monitored Parameters	Category of Turbochargers				Notes
		B		C		
		Alarm	Indication	Alarm	Indication	
1	Speed	high ⁽⁴⁾	X ⁽⁴⁾	high ⁽⁴⁾	X ⁽⁴⁾	
2	Exhaust gas at each turbocharger inlet, temperature	high ⁽¹⁾	X ⁽¹⁾	high	X	High temp. alarms for each cylinder at engine is acceptable ⁽²⁾
3	Lub. oil at turbocharger outlet, temperature			high	X	If not forced system, oil temperature near bearings
4	Lub. oil at turbocharger inlet, pressure	low	X	low	X	Only for forced lubrication systems ⁽³⁾

- ⁽¹⁾ For Category B turbochargers, the exhaust gas temperature may be alternatively monitored at the turbocharger outlet, provided that the alarm level is set to a safe level for the turbine and that correlation between inlet and outlet temperatures is substantiated.
- ⁽²⁾ Alarm and indication of the exhaust gas temperature at turbocharger inlet may be waived if alarm and indication for individual exhaust gas temperature is provided for each cylinder and the alarm level is set to a value safe for the turbocharger.
- ⁽³⁾ Separate sensors are to be provided if the lubrication oil system of the turbocharger is not integrated with the lubrication oil system of the diesel engine or if it is separated by a throttle or pressure reduction valve from the diesel engine lubrication oil system.
- ⁽⁴⁾ On turbocharging systems where turbochargers are activated sequentially, speed monitoring is not required for the turbocharger(s) being activated last in the sequence, provided all turbochargers share the same intake air filter and they are not fitted with waste gates.

ANNEX C - SAFETY MEASURES AGAINST CHEMICAL TREATMENT FLUIDS USED FOR EXHAUST GAS CLEANING SYSTEMS AND THE RESIDUES WHICH HAVE HAZARDOUS PROPERTIES

■ **ANNEX C – SAFETY MEASURES AGAINST CHEMICAL TREATMENT FLUIDS USED FOR EXHAUST GAS CLEANING SYSTEMS AND THE RESIDUES WHICH HAVE HAZARDOUS PROPERTIES** has been changed and should be read as follows:

1 GENERAL

1.1 With regard to regulation 14 of MARPOL Annex VI requiring ships to use fuel oil with a sulphur content not exceeding that stipulated in regulations 14.1 or 14.4, regulation 4 allows, with the approval of the Administration, the use of an alternative compliance method at least as effective in terms of emission reductions as that required by the MARPOL Annex VI, including the standards set forth in regulation 14.

1.2 As some types of exhaust gas cleaning systems to be approved by the Administration as “alternative compliance method” consume chemicals which are typically carried on board in bulk quantities, the prescriptive requirements contained in this UR related safety measures against chemical treatment fluids apply to exhaust gas cleaning systems using such fluids. In this context, the term “chemical treatment fluid” means the aqueous solution of sodium hydroxide (NaOH) or calcium hydroxide (Ca(OH)₂) that has corrosive properties or are considered to represent a hazard to personnel (See section 2 of this Annex).

1.3 For exhaust gas cleaning systems using chemicals other than the above, safety measures are to be taken according to the result of a risk assessment to be conducted to analyze the risks, in order to eliminate or mitigate the hazards to personnel brought by the use of such exhaust gas cleaning systems, to an extent equivalent to systems complying with requirements stated in section 2 of this Annex.

2 REQUIREMENTS FOR EXHAUST GAS CLEANING SYSTEMS USING AQUEOUS SOLUTION OF NaOH OR Ca(OH)₂ FOR CHEMICAL TREATMENT FLUID

2.1 The storage tank for chemical treatment fluids is to be arranged so that any leakage will be contained and prevented from making contact with heated surfaces. All pipes or other tank penetrations are to be provided with manual closing valves attached to the tank. In cases where such valves are provided below top of tank, they are to be arranged with quick acting shutoff valves which are to be capable of being remotely operated from a position accessible even in the event of chemical treatment fluid leakages. Tank and piping arrangements are to be approved.

2.2 The storage tank is to be protected from excessively high or low temperatures applicable to the particular concentration chemical treatment fluids. Depending on the operational area of the ship, this may necessitate the fitting of heating and/or cooling systems.

2.3 If a storage tank for chemical treatment fluids is installed in a closed compartment, the area is to be served by an effective mechanical ventilation system of extraction type providing not less than 6 air changes per hour which is independent from the ventilation system of other spaces. The ventilation system is to be capable of being controlled from outside the compartment. A warning notice requiring the use of such ventilation before entering the compartment shall be provided outside the compartment adjacent to each point of entry.

2.4 The storage tank may be located within the engine room. In this case, the requirements of 2.3 shall be complied with, except that a separate ventilation system is not required when the general ventilation system for the space is arranged so as to provide an effective movement of air in the vicinity of the storage tank and is maintained in operation continuously except when the storage tank is empty and has been thoroughly ventilated.

2.5 Each storage tank for chemical treatment fluids is to be provided with level monitoring arrangements and high/low level alarms. In cases where heating and/or cooling systems are provided, high and/or low temperature alarms or temperature monitoring are also to be provided accordingly.

2.6 The storage tanks are to have sufficient strength to withstand a pressure corresponding to the maximum height of a fluid column in the overflow pipe, with a minimum of 2.4 m above the top plate taking into consideration the specific density of the treatment fluid.

2.7 Where chemical treatment fluid is stored in integral tanks, the following are to be considered during the design and construction:

- These tanks may be designed and constructed as integral part of the hull, (e.g. double bottom, wing tanks).

- These tanks are to be coated with appropriate anti-corrosion coating and are to be segregated by cofferdams, void spaces, pump rooms, empty tanks or other similar spaces so as to not be located adjacent to accommodation, cargo spaces containing cargoes which react with chemical treatment fluids in a hazardous manner as well as any food stores, oil tanks and fresh water tanks.
- These tanks are to be designed and constructed as per the structural requirements applicable to hull and primary support members for a deep tank construction.
- These tanks are to be included in the ship's stability calculation.

2.8 The requirements specified in item 2.3 of this Annex also apply to closed compartments normally entered by persons:

- when they are adjacent to the integral storage tank for chemical treatment fluids and there are possible leak points (e.g. manhole, fittings) from these tanks; or
- when the treatment fluid piping systems pass through these compartments, unless the piping system is made of steel or other equivalent material with melting point above 925 degrees C and with fully welded joints.

2.9 The chemical treatment fluid piping and venting systems are to be independent of other ship service piping and/or systems. The chemical treatment fluid piping systems are not to be located in accommodation, service spaces, or control stations. The vent pipes of the storage tank are to terminate in a safe location on the weather deck and the tank venting system is to be arranged to prevent entrance of water into the tank for chemical treatment fluids.

2.10 Storage tanks and pipes/piping systems and drip trays for chemical treatment fluids which transfer undiluted chemical treatment fluids are to be of steel or other equivalent material with a melting point above 925 degrees C.

2.11 Storage tanks and pipes/piping systems for chemical treatment fluids are to be made with a material compatible with chemical treatment fluids, or coated with appropriate anti-corrosion coating.

NOTE: Several metals are incompatible with the chemical treatment fluids, e.g. NaOH is incompatible with zinc, aluminium, etc.

2.12 Regardless of design pressure and temperature, piping systems containing chemical treatment fluids only are to comply with the requirements applicable to Class I piping systems. As far as practicable, e.g. except for the flange connections that connect to tank valves, the piping systems are to be joined by welding.

2.13 The following connections are to be screened and fitted with drip trays to prevent the spread of any spillage where they are installed:

- Detachable connections between pipes (flanged connections and mechanical joints, etc.);
- Detachable connections between pipes and equipment such as pumps, strainers, heaters, valves; and
- Detachable connections between equipment mentioned in the above sub-paragraph.

The drip trays are to be fitted with drain pipes which lead to appropriate tanks, such as residue tanks, which are fitted with high level alarm, or are to be fitted with alarms for leak detection. In cases where such tank is an integral tank, item 2.7.1 and 2.7.2 of this Annex are to be applied to the tank.

2.14 For the protection of crew members, the ship is to have on board suitable personnel protective equipment. The number of personnel protective equipment carried onboard is to be appropriate for the number of personnel engaged in regular handling operations or that may be exposed in the event of a failure; but in no case is there to be less than two sets available onboard.

2.15 Personnel protective equipment is to consist of protective clothing, boots, gloves and tight-fitting goggles.

Eyewash and safety showers are to be provided, the location and number of these eyewash stations and safety showers are to be derived from the detailed installation arrangements. As a minimum, the following stations are to be provided:

- In the vicinity of transfer or treatment pump locations. If there are multiple transfer or treatment pump locations on the same deck then one eyewash and safety shower station may be considered for acceptance provided that the station is easily accessible from all such pump locations on the same deck.
- An eyewash station and safety shower is to be provided in the vicinity of a chemical bunkering station on-deck. If the bunkering connections are located on both port and starboard sides, then consideration is to be given to providing two eyewash stations and safety showers, one for each side.
- An eyewash station and safety shower is to be provided in the vicinity of any part of the system where a spillage/drainage may occur and in the vicinity of system connections/components that require periodic maintenance.

2.16 Storage tanks for chemical treatment fluids are to be arranged so that they can be safely emptied of the fluids and ventilated by means of portable or permanent systems.

3 REQUIREMENT FOR EXHAUST GAS CLEANING SYSTEMS DISCHARGE WATER PIPELINE

3.1 Overboard discharges from exhaust gas cleaning system (EGCS) are not to be interconnected to other systems.

3.2 Due consideration is to be given to the location of overboard discharges with respect to vessel propulsion features, such as thrusters, propellers or to prevent any discharge water onto survival craft during abandonment.

PART 9**AMENDMENTS No. 4**

3.3 The piping material for the EGCS discharge water pipeline system is to be selected based on the corrosive nature of the liquid media.

3.4 Special attention is to be paid to the corrosion resistivity of EGCS overboard discharge piping. Where applicable, adequate arrangements are to be provided to prevent galvanic corrosion due to the use of dissimilar metals.

3.5 In case distance piece is fitted between the outboard discharge valve and the shell plating, it shall be made of corrosion resistant material steel or be coated with an anti-corrosive material suitable for the operating environment. The thickness of the distance piece shall be at least the minimum values specified in .1 and .2 as below; otherwise Sch. 160 thickness specified in piping standards shall, as far as practicable, be used.

.1 12 mm in cases where complete pipe is made of corrosion resistant material steel.

.2 15 mm of mild steel in cases where the inside the pipe is treated with an anticorrosive coating or fitted with a sleeve of corrosion resistant material.

4 MISCELLANEOUS

4.1 Tanks for residues generated from the exhaust gas cleaning process are to satisfy the following requirements:

- The tanks are to be independent from other tanks, except in cases where these tanks are also used as the overflow tanks for chemical treatment fluids storage tank.
- Tank capacities are to be decided in consideration of the number and kinds of installed exhaust gas cleaning systems as well as the maximum number of days between ports where residue can be discharged ashore. In the absence of precise data, a figure of 30 days is to be used.
- Where residue tanks used in closed loop chemical treatment systems are also used as the overflow tanks for chemical treatment fluids storage tank, the requirements for storage tanks apply.