

**RULES
FOR THE CLASSIFICATION OF
SHIPS**

*Part 12 – ELECTRICAL EQUIPMENT
July 2023*

*Amendments No. 2
July 2024*

CROATIAN REGISTER OF SHIPPING

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

Amendments No. 2 to the
RULES FOR THE CLASSIFICATION OF SHIPS
Part 12 – ELECTRICAL EQUIPMENT

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 12 – Electrical Equipment, edition July 2023, as last amended by Amendments No. 1, 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 Organizations:

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)

Resolutions: MSC.474(102)

International Association of Classification Societies (IACS)

Unified Requirements (UR):

E5 (Rev.1, 2005), E7 (Rev.5, 2021), E9 (Rev.1, 2012), E10 (Rev.9, 2023), E11 (Rev.4, 2021),
E12 (Rev.2, 2020), E13 (Rev.3 Corr.1, 2022), E15 (Rev.4, 2020), E16 (2002), E17 (Rev.1, 2021),
E18 (Rev.1, 2014), E19 (Rev.1, 2005), E20 (Rev.1, 2009), E21 (Rev.1 Corr.1, 2022), E22 (Rev.3, 2023),
E24 (Rev.1, 2018), E25 (Rev.2, 2022), E26 (Rev.1, 2023), E27 (Rev.1, 2023)
M64 (Rev.1, 2004)

Unified Interpretations (UI):

SC1 (Rev.2, 2021), SC3 (Rev.1, 1999), SC4 (1985), SC5 (1985), SC6 (Rev.1, 2019), SC7 (1985), SC8 (1985),
SC9 (1985), SC10 (Rev.3, 2021), SC11 (Rev.1, 2021), SC12 (1985), SC13 (1985), SC17 (Rev.3, 2020),
SC70 (Rev.4 Corr.1, 2023), SC83 (1993), SC94 (Rev.2 Corr.1, 2018), SC95 (1994),
SC124 (Rev.1 Corr.1, 2007), SC134 (2002), SC136 (Rev.3, 2005), SC151 (1999), SC152 (1999),
SC157 (Rev.1, 2005), SC176 (Rev.1, 2004), SC180 (Rev.4, 2021), SC184 (Rev.1, 2005), SC185 (Rev.1, 2005),
SC186 (Corr.1, 2010), SC187 (2004), SC194 (Rev.1, 2021), SC 274 (Rev.1, 2021), SC290 (2018)

Unified Recommendations:

Rec. 73 (Rev.3, 2023), Rec. 35 (Rev.2, 2021), Rec. 120 (2015), Rec. 178 (2023), Rec. 179 (2023)

TABLE 1 – REVIEW OF AMENDMENTS

This review comprises amendments in relation to the Rules for the Classification of Ships, Part 12 – Electrical Equipment, edition July 2023, as last amended by Amendments No. 1, edition January 2024.

<i>ITEM</i>	<i>DESCRIPTION OF THE AMENDMENTS</i>
SECTION 2 – CONSTRUCTION OF ELECTRICAL EQUIPMENT	
Head 2.5 – PROTECTIVE EARTHING	New item 2.5.5 has been added with reference to IACS Rec.178, Dec. 2023
Head 2.10 – COMPUTER-BASED SYSTEMS	Existing Head 2.10 has been completely revised to align with the new revision of IACS UR E22, Rev.3, June 2023
Head 2.12 – CYBER RESILIENCE	New Head 2.12 has been introduced in order to include requirements of IACS UR E26, Rev.1, Nov. 2023 and IACS UR E27, Rev.1, Sep. 2023. Reference to the Rules for the classification of ships, Part 1 – General requirements, Chapter 6 – Requirements for additional class notations, Section 6 – Cyber resilience, 6.3 has been entered
SECTION 9 – EMERGENCY SOURCE OF ELECTRICAL POWER	
Head 9.5 - STARTING ARRANGEMENTS FOR EMERGENCY DIESEL GENERATORS	Item 9.5.6 has been added with reference to new IACS Rec.179, Dec. 2023

2 CONSTRUCTION OF ELECTRICAL EQUIPMENT

■ **Head 2.5 – PROTECTIVE EARTHING**, new item 2.5.5 has been added and should be read as follows:

2.5.5 Overall Earthing System: Protective Earthing, System Earthing - Guidelines

2.5.5.1 To identify the best practices for protective earthing for steel, aluminium, mobile or fixed offshore Units and non-metallic vessels see *IACS Recommendation No. 178 - Overall Earthing System: Protective Earthing, System Earthing - Guidelines*.

■ **Head 2.10 – ON BOARD USE AND APPLICATION OF COMPUTER BASED SYSTEMS** has been changed and should be read as follows:

2.10 COMPUTER-BASED SYSTEMS

2.10.1 Introduction

2.10.1.1 Scope

These requirements apply to design, construction, commissioning and maintenance of computer-based systems where they depend on software for the proper achievement of their functions.

These requirements apply to systems which provide control, alarm, monitoring, safety, or internal vessel communication functions that are subject to classification requirements.

2.10.1.2 Exclusion

Computer-based systems that are covered by statutory regulations are excluded from the requirements of this Head.

Guidance:

Examples of such systems are navigation systems and radio communication system required by SOLAS chapter V and IV, and vessel loading instrument/stability computer.

For loading instrument/stability computer, IACS recommendation no.48 may be considered.

2.10.1.3 References

2.10.1.3.1 Normative standards

For the purposes of this Head, the following standards are normative:

- IACS UR E10 Test specification for type approval
- IACS UR E26 Cyber resilience of ships
- IACS UR E27 Cyber resilience of on-board systems and equipment

2.10.1.3.2 Informative standards

For the purposes of this Head, the following standards are listed for information and may be used for the development of hardware/software of computer-based systems:

- IEC 61508:2010 Functional safety of electrical/electronic/programmable electronic safety-related systems
- ISO/IEC 12207:2017 Systems and software engineering – Software life cycle processes
- ISO 9001:2015 Quality Management Systems – Requirements
- ISO/IEC 90003:2018 Software engineering - Guidelines for the application of ISO 9001:2015 to computer software
- IEC 60092-504:2016 Electrical installations in ships - Part 504: Special features - Control and instrumentation
- ISO/IEC 25000:2014 Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - Guide to SQuaRE
- ISO/IEC 25041:2012 Systems and software engineering - Systems and software Quality Requirements and Evaluation (SQuaRE) - Evaluation guide for developers, acquirers and independent evaluators
- IEC 61511:2016 Functional safety - Safety instrumented systems for the process industry sector
- ISO/IEC 15288:2015 Systems and software engineering - System life cycle process
- ISO 90007:2017 Quality management – Guidelines for configuration management
- ISO 24060:2021 Ships and marine technology - Ship software logging system for operational technology

Other industry standards may also be considered.

2.10.1.4 Structure

The general certification requirements for computer-based systems and the relation to type approval is described in 2.10.2. The requirements and extent of verification of a computer-based system depends on its categorization into one of three categories. The categories are described in 2.10.3.

The requirements of this Head cover the lifecycle of computer-based system from design through operations. The requirements are split into groups representing the different phases of the life cycle and the roles responsible for fulfilling the requirements.

The activities related to the development and delivery of a computer-based system is described in 2.10.4, while the activities related to the maintenance in the operational phase are described in 2.10.5.

Management of changes to software and systems is given special attention in this Head, and the main aspects of a management of change process are described in 2.10.6.

Most requirements in this Head are related to the way of working, and thus focus on activities to be performed, but it also contains some technical requirements. The technical requirements on computer-based systems have been gathered in 2.10.7.

Each activity contains a requirement part which describes the minimum requirements on the role in question, and a part which describes the *Register's* verification of the activity in question.

2.10.1.5 Definition of abbreviations and terminology

2.10.1.5.1 Abbreviations

Table 2.10.1.5.1

Abbreviations

Abbreviation:	Expansion:
Cat I	Category one systems as defined in paragraph 2.10.3.1
Cat II	Category two systems as defined in paragraph 2.10.3.1
Cat III	Category three systems as defined in paragraph paragraph 2.10.3.1
COTS	Commercial off-the-shelf
FAT	Factory acceptance test
FMEA	Failure mode and effect analysis
IT	Information technology
OT	Operational technology
PMS	Planned maintenance system
SAT	System acceptance test
SOST	System of systems test
SSLS	Ship software logging system
UR	Unified requirement

2.10.1.5.2 Terminology

Table 2.10.1.5.2

Terminology

Term:	Definition:
Black-box description	A description of a system's functionality and behaviour and performance as observed from outside the system in question
Black-box test methods	Verification of the functionality, performance, and robustness of a system, sub-system or component by only manipulating the inputs and observing the outputs. This does not require any knowledge of the system's inner workings and focuses only on the observable behaviour of the system/component under test in order to achieve the desired level of verification.
Computer based system (CBS)	A programmable electronic device, or interoperable set of programmable electronic devices, organized to achieve one or more specified purposes such as collection, processing, maintenance, use, sharing, dissemination, or disposition of information. CBSs onboard include IT and OT systems. A CBS may be a combination of subsystems connected via network. Onboard CBSs may be connected directly or via public means of communications (e.g. Internet) to ashore CBSs, other vessels' CBSs and/or other facilities.

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Term:	Definition:
Failure mode description	A document describing the effects due to failures in the system, not failures in the equipment supported by the system. The following aspects shall be covered: - list of failures which are subject to assessment, with - description of the system response to each of the above failures - comments to the consequence of each of these failures
Owner	The organization or person which orders the vessel in the construction phase or the organization which owns or manages the vessel in service. In the context of this UR this is a defined role with specific responsibilities.
Parameterization	To configure and tune system and software functionality by changing parameters. It does not usually require-computer programming and is normally done by the system supplier or a service provider, not the operator or end-user.
Programmable device	Physical component where software is installed
Robustness	The ability to respond to abnormal inputs and conditions
Service supplier	A person or company, not employed by an IACS Member, who at the request of an equipment manufacturer, shipyard, vessel's owner or other client acts in the connection with inspection work and provides services for a ship or a mobile offshore unit such as measurements, tests or maintenance of safety systems and equipment, the results of which are used by surveyors in making decisions affecting classification or statutory certification and services
Simulation test	Monitoring, control, or safety system testing where the equipment under control is partly or fully replaced with simulation tools, or where parts of the communication network and lines are replaced with simulation tools.
Register Certificate	Compliance document issued by a <i>Register</i> stating: - conformity with applicable rules and 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)
Software component	A standalone piece of code that provides specific and closely coupled functionality.
Software master files	The computer-files that constitutes the original source of the software. For custom made software this may be readable source- code files, and for COTS software it may be different forms of binary files.
Software-structure	Overview of how the different software components interact and is commonly referred to as the Software Architecture, or Software Hierarchy
Sub-system	Identifiable part of a system, which may perform a specific function or set of functions.
Supplier	A generic term used for any organisation or person that is a contracted or a subcontracted provider of services, system components, or software.
System	A combination of components, equipment and logic which has a defined purpose, functionality, and performance. In the context of this Head, a specific system is delivered by one system supplier.
System of systems	A system which is made up of several systems In the context of this Head, the system of systems encompasses all monitoring, control and safety systems delivered from the Shipyard as a part of a vessel
System supplier	An organisation or person that is contracted or a subcontracted provider of system components or software under the coordination of the Systems integrator. In the context of this Head this is a defined role with specific responsibilities.
Systems integrator	Single organization or a person coordinating interaction between suppliers of systems and sub-systems on all stages of life cycle of computer based systems in order to integrate them into a verified vessel-wide system of systems and to provide proper operation and maintenance of the computer based systems. In the context of this Head this is a defined role with specific responsibilities. During the design and delivery phase the Shipyard is the default Systems integrator, during operations phase the Owner is the default.
Type approval Certificate	Compliance document issued by a <i>Register</i> by which the <i>Register</i> declares that a product design meets a minimum set of technical requirements
Vessel	Ship or offshore unit where the computer based system is to be installed.

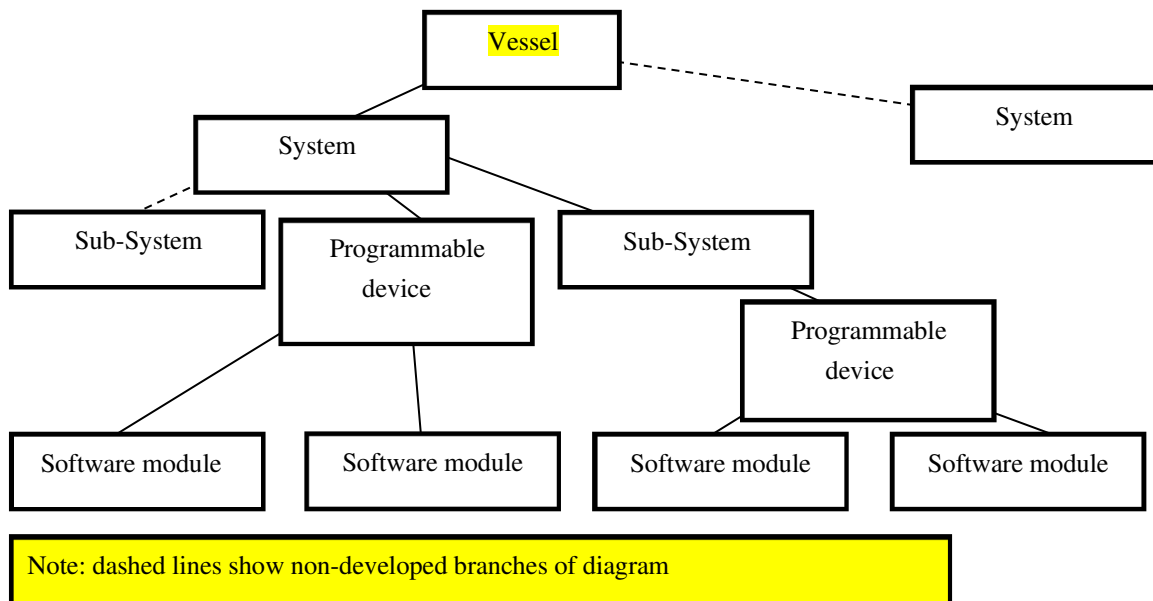


Figure 2.10.1.5.2 - Illustrative System Hierarchy

2.10.2 Approval of system and components

2.10.2.1 System certification

Computer-based systems that are necessary to accomplish vessel-functions of category II or category III (as defined in 2.10.3.1 below) shall be delivered with a vessel-specific *Register* certificate. The objective of the vessel-specific system certification is to confirm that design and manufacturing of the system has been completed and that the system complies with applicable *Rules*.

Vessel-specific system certification consist of two main verification activities:

- .1 Assessment of vessel-specific documentation (see 2.10.4.2 and 2.10.6)
- .2 Survey and testing of the system to be delivered to the vessel (see 2.10.4.2.7)

The *Register* may accept Alternative Certification Scheme (ACS) provided that the requirements are met, and that the system is provided with a vessel-specific certificate.

2.10.2.2 Type approval of computer-based systems

Computer-based systems that are routinely manufactured and include standardized software functions may be type approved in accordance with specified *Rules*. Hardware shall be documented according to the requirement in 2.10.4.2.4.

The type approval consist of two main verification activities:

- .1 Assessment of type-specific documentation
- .2 Survey and testing of the standardized functions

Type approval will normally not yield exemption from vessel-specific system certification since vessel-specific functions, parameter configurations and installation elements demand vessel-specific verification.

2.10.3 System categories

2.10.3.1 System category definitions

The categorization of a system in the context of this Head is based on the potential severity of the consequences if the system serving the function fails. Table 2.10.3.1 provides the definitions of the categories.

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Table 2.10.3.1
System categories

Category:	Failure effects:	Typical System functionality:
I	Those systems, failure of which will not lead to dangerous situations for human safety, safety of the vessel and/or threat to the environment.	- Monitoring, informational and administrative functions
II	Those systems, failure of which could eventually lead to dangerous situations for human safety, safety of the vessel and/or threat to the environment.	- Vessel alarm, monitoring and control functions which are necessary to maintain the vessel in its normal operational and habitable conditions
III	Those systems, failure of which could immediately lead to dangerous or catastrophic situations for human safety, safety of the vessel and/or threat to the environment.	- Control functions for maintaining the vessel's propulsion and steering - Vessel safety functions

2.10.3.2 Registers' scope

Category I systems are normally not subject to verification by the Register, as failure of these systems shall not lead to dangerous situations. However, information pertinent to category I systems shall be required upon request to determine the correct category or ensure that they do not influence the operation of systems in category II and category III.

2.10.3.3 System category examples

The category of a system shall always be evaluated in the context of the specific vessel in question; thus, the categorization of a system may vary from one vessel to the next. This means that the examples of categories below are given as guidance only. For determining the categorization of systems for a specific vessel, see 2.10.4.3.3.

Examples of category I systems:

Fuel monitoring system, maintenance support system, diagnostics and troubleshooting system, closed circuit television, cabin security, entertainment system, fish detection system.

Examples of category II systems:

Fuel oil treatment system, alarm monitoring and safety systems for propulsion and auxiliary machinery, Inert gas system, control, monitoring and safety system for cargo containment system.

Examples of category III systems:

Propulsion control system, steering gear control system, electric power system (including power management system), dynamic positioning system (IMO classes 2 and 3).

The list of example systems is not exhaustive.

2.10.4 Requirements on development and certification of computer-based system

2.10.4.1 General requirement

2.10.4.1.1 Life cycle approach with appropriate standards

Requirement:

A global top-down approach shall be undertaken in the design and development of both hardware and software and the integration in sub-systems, systems, and system of systems, spanning the complete system lifecycle. This approach shall be based on the standards as listed herein or other standards recognized by the Register.

Register's verification:

This is verified by the Register as a part of the quality management system verification described in 2.10.4.1.2.

2.10.4.1.2 Quality management system

Systems integrators and system suppliers shall, in the development of computer-based systems for category II and category III, comply to a recognised quality standard such as ISO 9001; also incorporating principles of IEC/ISO 90003.

The quality management system shall as a minimum include the following topics, applicable for both category II and category III systems:

Table 2.10.4.1.2
Quality management system

Area		Role	
No.	Topic	System supplier	Systems integrator
1	Responsibilities and competency of the staff.	x	x
2	The complete lifecycle of delivered software and of associated hardware	x	x
3	Specific procedure for unique identification of a computer-based system, its components and versions.	x	
4	Creation and update of the vessel's system architecture		x
5	Organization set in place for acquisition of software and related hardware from suppliers	x	x
6	Organization set in place for software code writing and verification	x	
7	Organization set in place for system validation before integration in the vessel	x	
8	Specific procedure for conducting and approving of systems at FAT and SAT	x	x
9	Creation and update of system documentation	x	
10	Specific procedure for software modification and installation on board the vessel, including interactions with shipyard and owner	x	x
11	Specific procedures for verification of software code	x	
12	Procedures for integrating systems with other systems and testing of the system of systems for the vessel	x	x
13	Procedures for managing changes to software and configurations before FAT	x	
14	Procedures for managing and documenting changes to software and configurations after FAT	x	x
15	Checkpoints for the organization's own follow-up of adherence to the quality management system	x	x

Register's verification:

The quality management system may be verified by two alternative means:

- 1) The Register confirming that the quality management system is certified as compliant to a recognized standard by an organisation with accreditation under a national accreditation scheme.
- 2) The Register confirming compliance to a standard through a specific assessment of the quality management system. The documentation requirements will be defined per case.

2.10.4.2 Requirements on the system supplier

2.10.4.2.1 Define and follow a quality plan

Requirement:

The system supplier shall document that the quality management system is applied for the design, construction, delivery, and maintenance of the specific system to be delivered.

All applicable items described in 2.10.4.1.2 (for the system supplier role) shall be demonstrated to exist and being followed, as relevant.

Register's verification:

Category I: No documentation required

Category II and III: The quality plan shall be available during survey (FAT) or submitted for information upon request

(FD).

2.10.4.2.2 Unique identification of systems and software

Requirement:

A method for unique identification of a system, its different software components and different revisions of the same software component shall be applied. The method shall be applied throughout the lifecycle of the system and the software.

See also 2.10.7.1 for related technical requirements on the system in question.

The documentation of the method is typically a part of the quality management system, see 2.10.4.1.2.

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Register's verification:

Category I: Not required

Category II and III: Application of the identification system is verified as a part of the FAT (2.10.4.2.7) and SAT (2.10.4.3.6)

2.10.4.2.3 System description

Requirement:

The system's specification and design shall be determined and documented in a system description. In addition to serve as a specification for the detailed design and implementation, the purpose of the system description is to document that the entire system-delivery is according to the specifications and in compliance with applicable rules and regulations.

The system description shall contain information of the following:

- Purpose and main functions, including any safety aspects
- System category as defined
- Key performance characteristics
- Compliance with the technical requirements and *Rules*
- User interfaces/mimics
- Communication and Interface aspects
 - o Identification and description of interfaces to other vessel systems
- Hardware-arrangement related aspects:
 - Network-architecture/topology, including all network components like switches, routers, gateways, firewalls etc.
 - Internal structure with regards to all interfaces and hardware nodes in the system (e.g. operator stations, displays, computers, programmable devices, sensors, actuators, I/O modules etc)
 - I/O allocation (mapping of field devices to channel, communication link, hardware unit, logic function)
 - Power supply arrangement
 - Failure mode description

Guidance:

The information listed above is in these requirements collectively referred to as the system description. It may however be divided into a number of different documents and models.

Register's verification:

Category I: The system description documentation shall upon request be submitted for information (FI).

Category II and III: The system description documentation shall be submitted for approval (AP).

2.10.4.2.4 Environmental compliance of hardware components

Requirement:

Evidence of environmental type testing according to IACS UR E10 regarding hardware elements included in the system and sub-systems shall be submitted to the *Register*.

Register's verification:

Category I: This requirement is not mandatory for category I systems. Reference to Type approval certificate or other evidence of type testing shall upon request be submitted for information (FI) see 2.10.3.2.

Category II and III: Reference to Type approval certificate or other evidence of type testing shall be submitted for information (FI).

2.10.4.2.5 Software code creation, parameterization, and testing

Requirement:

The software created, changed, or configured for the delivery project shall be developed and have the quality assurance activities assessed according to the selected standard(s) as described in the quality plan.

The quality assurance activities may be performed on several levels of the software-structure and shall include both custom-made software and configured components (e.g. software libraries) as appropriate.

The verification of the software shall as a minimum verify the following aspects based on black-box methods:

- Correctness, completeness and consistency of any parameterization and configuration of software components
- Intended functionality
- Intended robustness

For components in systems of Category II and III, the scope, purpose, and results of all performed reviews, analyses, tests, and other verification activities shall be documented in test reports.

Guidance:

Some of the methods utilized in this activity are sometimes referred to as “software unit test” or “developer test” and may also include verification methods like code-reviews and static- or dynamic code analysis.

Register’s verification:

Category I: No documentation required

Category II and III: Software test reports shall upon request be submitted for information (FI).

2.10.4.2.6 Internal system testing before FAT**Requirement:**

The system shall as far as practicable be tested before the FAT. The main purpose of the system test is for the system supplier to verify that the entire system delivery is according to the specifications, approved documentation and in compliance with applicable rules and regulations; and further, that the system is completed and ready for the FAT.

The testing shall at least verify the following aspects of the system:

- Functionality
- Effect of faults and failures (including diagnostic functions, detection, alerts response)
- Performance
- Integration between software and hardware components
- Human-machine interfaces
- Interfaces to other systems

Faults are to be simulated as realistically as possible to demonstrate appropriate system fault detection and system response.

Some of the testing may be performed by utilizing simulators and replica hardware.

The test-environment shall be documented, including a description of any simulators, emulators, test-stubs, test-management tools, or other tools affecting the test environment and its limitations.

Test cases and test results shall be documented in test programs and test reports respectively.

Register’s verification:

Category I: No documentation required

Category II and III: Internal system test report shall be made available during FAT or submitted upon request (FI)

2.10.4.2.7 Factory acceptance testing (FAT) before installation on board**Requirement:**

A factory acceptance test (FAT) shall be arranged for the system in question. The main purpose of the FAT is to demonstrate to the *Register* that the system is completed and compliant with applicable *Rules*, thus enabling issuance of a *Register Certificate* for the system.

The FAT test program shall cover a representative selection of the test items from the internal system test (described in 2.10.4.2.6), including normal system functionality and response to failures.

For category II and III systems, network testing to verify the network resilience requirements in 2.10.7.2.1 shall be performed. If agreed by all parties, the network testing may be performed as a part of the system test onboard the vessel.

The FAT shall as a rule be performed with the project specific software operating on the actual hardware components to be installed on board, with necessary means for simulation of functions and failure responses, however other solutions such as replica hardware or simulated hardware (emulators) may be agreed with the *Register*.

For each test-case it shall be noted if the test passed or failed, and the test-results shall be documented in a test report. The test report shall also contain a list of the software (including software versions) that were installed in the system when the test was executed.

Guidance:

For complex systems there may be a large difference in scope between the “Internal system testing before FAT” activity and the FAT, while for some systems the scope may be identical.

Register’s verification:

Category I: FAT not required.

Category II and III: The FAT program shall be approved (AP) before the test is executed.

The FAT execution shall be witnessed by the *Register*.

The FAT report shall be submitted for information (FI).

Additional FAT documentation including e.g., user manuals and internal system test report shall be made available during FAT or submitted upon request for information (FI).

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2.10.4.2.8 Secure and controlled software installation on the vessel**Requirement:**

The initial installation and subsequent updates of the software components of the system shall be done according to a management of change procedure which has been agreed between the system supplier and the systems integrator.

The management of change procedure shall comply with the requirements in 2.10.6.

Cyber security measures shall be observed as described in relevant *Rules*.

Register's verification:

Category I: Not required

Category II and III: The management of change procedure shall upon request be submitted for information (FI).

2.10.4.3 Requirements on the systems integrator**2.10.4.3.1 Responsibilities**

For the purposes of these requirements, the Shipyard is considered as the systems integrator in the development and delivery phase unless another organization or person is explicitly appointed by the Shipyard.

2.10.4.3.2 Define and follow a quality plan**Requirement:**

The systems integrator shall document that the quality management system is applied for the installation, integration, completion, and maintenance of the systems to be installed on board. All applicable items described in 2.10.4.1.2 (for the systems integrator role) shall be demonstrated to exist and being followed, as relevant.

Register's verification:

Category I: No documentation required

Category II and III: The quality plan shall be made available during survey (at SAT/SOST) or upon request submitted for information (FI).

2.10.4.3.3 Determining the category of the system in question**Requirement:**

For each system delivery to a particular vessel, it shall be decided which category the system falls under based on the failure effects of the system (as defined in 2.10.3). The category for a specific system must be conveyed to the relevant system supplier. The *Register* may decide that a risk-assessment is needed to verify the proper system category.

Register's verification:

Category I, II and III: The category for the different systems shall upon request be documented and submitted for approval (AP).

2.10.4.3.4 Risk assessment of the system**Requirement:**

If requested by the *Register*, a risk assessment of a specific system in context of the specific vessel in question shall be performed and documented in order to determine the applicable category for the system.

Guidance:

IEC/ISO31010 "Risk management - Risk assessment techniques" may be used as guidance in order to determine method of risk assessment.

Register's verification:

Category I, II and III: The risk assessment report shall upon request be submitted for approval (AP).

2.10.4.3.5 Define the vessel's system-architecture**Requirement:**

The system of systems (SoS) shall be specified and documented. This architecture specification provides the basis for category determination and development of the different integrated systems by allocating functionality to individual systems and by identifying the main interfaces between the systems. It shall also serve as a basis for the testing of the integrated systems on the vessel level (see 2.10.4.3.7).

The vessel's system architecture shall at least contain description of:

- Overview of the total systems architecture (the system of systems)
- Each system's purpose and main functionality
- Communication and interface aspects between different systems

Guidance:

See also the *Rules for the classification of ships, Part I – General requirements, Chapter 6 – Requirements for additional class notations, 6.2* for diagram of security zones and conduits

Register's verification:

Category I, II, and III: The vessel's system architecture shall upon request be submitted for information (FI).

2.10.4.3.6 System acceptance test (SAT) onboard the vessel**Requirement:**

A system acceptance test shall be arranged onboard the vessel. The main purpose of the system acceptance test (SAT) is to verify the system functionality, after installation and integration with the applicable machinery/electrical/process systems on board including possible interfaces with other control and monitoring systems.

For each test-case it shall be noted if the test passed or failed, and the test-results shall be documented in a test report. The test report shall also contain a list of the software (including software versions) that were installed in the system when the test was executed.

Register's verification:

Category I: Not required.

Category II and III: The SAT program shall be submitted for approval (AP) before the test is executed.

The SAT execution shall be witnessed by the *Register*.

The SAT report shall be submitted for information (FI).

2.10.4.3.7 Testing of integrated systems on vessel-level (SOST)**Requirement:**

Integration tests shall be conducted after installation and integration of the different systems in its final environment on board. The purpose of the tests is to verify the functionality of the complete installation (system of systems) including all interfaces and inter-dependencies in compliance with requirements and specifications.

The testing shall at least verify the following aspects of the system of systems:

- The overall functionality of the interacting systems as a whole
- Failure response between systems
- Performance
- Human-machine interfaces
- Interfaces between the different systems

Guidance:

For complex systems there may be a large difference in scope between the "System acceptance test (SAT) onboard the vessel" activity and the SOST, while for some systems the scope may be overlapping or identical. It is possible to combine the two activities into one when the test scope is similar.

Register's verification:

Category I: Not required.

Category II and III: The SOST program shall be submitted for approval (AP) before the test is executed.

The SOST execution shall be witnessed by the *Register*.

The SOST report shall be submitted for information (FI).

2.10.4.3.8 Change management

The systems integrator shall follow procedures for management of change to the system as described in 2.10.6.

Register's verification:

Category I: No documentation requirements

Category II and III: The management of change procedure shall upon request be submitted for information (FI).

2.10.5 Requirements on maintenance of computer-based systems**2.10.5.1 Requirements on the Vessel Owner****2.10.5.1.1 Responsibilities**

For the purposes of these requirements, the vessel owner is considered to be the systems integrator in the operations phase unless another organization or person is explicitly appointed by the owner.

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Accordingly, the *Register* shall in a timely manner be informed by the owner about the appointed systems integrator which is responsible for implementing any changes to the systems in conjunction with system supplier(s).

2.10.5.2 Requirements on the Systems integrator**2.10.5.2.1 Change management****Requirement:**

The systems integrator shall ensure that necessary procedures for software and hardware change management exist on board, and that any software modification/upgrade are performed according to the procedure(s). For details about change management please see 2.10.6.

Changes to computer-based systems in the operational phase shall be recorded.

The records shall contain information about the relevant software versions and other relevant information as described in

2.10.6.1.1.***Register's* verification:**

Category I: No documentation requirements

Category II and III: See 2.10.6.12.

2.10.5.3 Requirements on the System Supplier**2.10.5.3.1 Change management****Requirement:**

The system supplier shall follow procedures for maintenance of the system including procedures for management of change as described in 2.10.6.

***Register's* verification:**

Category I: No documentation requirements

Category II and III: See 2.10.6.12.

2.10.5.3.2 Testing of changes before installation onboard**Requirement:**

The system supplier shall make sure that the planned changes to a system have passed relevant in-house tests before the change is made to systems on board.

***Register's* verification:**

Category I: No documentation requirements

Category II and III: See 2.10.6.12.

2.10.6 Management of change**2.10.6.1 General**

2.10.6 provides requirements for the management of change throughout the lifecycle of a computer-based system. Different procedures for the management of change may be defined for specific phases in a system's lifecycle as the different phases typically involve different stakeholders. The *Register's* verification is described in 2.10.6.12.

2.10.6.2 Documented change management procedures**Requirement:**

The organization in question shall have defined and documented change management procedures applicable for the computer-based system in question covering both hardware and software. After FAT, the system supplier shall manage all changes to the system in accordance with the procedure. Examples could be qualification of new versions of acquired software, new hardware, modified control logic, changes to configurable parameters.

The procedure(s) shall at least describe the activities listed in 2.10.6.3 through 2.10.6.11. The outcome of the impact analysis in 2.10.6.8 will determine to what extent the activities in 2.10.6.3 to 2.10.6.12 shall be performed. Change records (described in 2.10.6.11) shall always be produced.

2.10.6.3 Agreement between relevant stakeholders**Requirement:**

The management of change process shall be coordinated and agreed between the relevant stakeholders along the different stages of the lifecycle of the computer-based system.

Guidance:

Typically, the management of change address at least three different stages:

- .1 Development and internal verification before FAT; involving the system supplier and sub-suppliers.
- .2 From FAT to handover of the vessel to the owner; involving the system supplier, the systems integrator, the Register, and the owner.
- .3 In operation; involving the system supplier, service suppliers, the owner, and the Register

2.10.6.4 Approved software shall be under change management**Requirement:**

If changes are required to a system after it has been approved by applicable stakeholders (typically the systems integrator and the Register at FAT) the modifications shall follow defined change management procedures.

2.10.6.5 Unique identification of system and software versions**Requirement:**

The system supplier shall make sure that each system and software version is uniquely identifiable, see paragraph

2.10.4.2.2.

2.10.6.6 Handling of software master files**Requirement:**

There shall be defined mechanisms for handling of the files that constitutes the master-files for a software component. Personnel authorities shall be clearly defined along with the tools and mechanisms used to ensure the integrity of the master files.

2.10.6.7 Backup and restoration of onboard software**Requirement:**

It shall be clearly defined how to perform backup and restoration of the software components of a computer-based system onboard the vessel.

2.10.6.8 Impact analysis before change is made**Requirement:**

Before a change to the system is made, an impact analysis shall be performed in order to:

- Determine the criticality of the change.
- Determine the impact on existing documentation.
- Determine the needed verification and test activities.
- Determine the need to inform other stakeholders about the change.
- Determine the need to obtain approval from other stakeholders (e.g. Register and or Owner) before the change is made.

2.10.6.9 Roll-back in case of failed software changes**Requirement:**

When maintenance includes installation of new versions of the software in the system, it shall be possible to perform a rollback of the software to the previous installed version with the purpose of returning the system to a known, stable state.

Roll-backs shall be documented and analysed to find and eliminate the root cause.

2.10.6.10 Verification and validation of system changes**Requirement:**

To the largest degree practically possible, modifications shall be verified before being installed onboard.

After installation, the modification(s) shall be verified onboard according to a documented verification program containing:

- Verification that the new functionalities and/or improvements have had the intended effect.
- Regression test to verify that the modification has not had any negative effects on functionality or capabilities that was not expected to be affected.

2.10.6.11 Change records

Changes to systems and software shall be documented in change records to allow for visibility and traceability of the changes. The change records shall contain at least the following items:

- The purpose for a change
- A description of the changes and modifications
- The main conclusions from the impact analysis (see 2.10.6.8)

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- The identity and version of any new system or software version(s) (see 2.10.6.5)
- Test reports or tests summaries (see 2.10.6.10)

Documentation of the changes to software may be recorded in the planned maintenance system (PMS), in a software registry or equivalent.

2.10.6.12 Verification of change management by the Register**2.10.6.12.1 In operation (vessel in service) phase**

The verification by the *Register* regarding the management of change in operation is generally performed during the annual survey of the vessel. Procedures for management of change and relevant change records (see 2.10.6.11) shall be made available at the time of survey.

In the cases where the change requires approval from the *Register* up front, the relevant procedures and documentation for the change in question may be verified at that time.

2.10.6.12.2 During newbuilding

The verification of management of change in the newbuilding phase is divided into two; Procedures are verified as a part of the verification of the quality management system (2.10.4.1.2), while project specific implementation of the procedures are verified during FAT (2.10.4.2.7) and after FAT (2.10.6.12.1).

2.10.7 Technical requirements on computer-based systems

The paragraphs below contain technical requirements on computer-based systems. The compliance to these requirements shall be documented in the design documentation (see 2.10.4.2.3) and verified through the verification activities described in these requirements.

2.10.7.1 Reporting of system and software identification and version**2.10.7.1.1 System identification**

The system shall provide means to identify its name, version, identifier, and manufacturer. It is recommended that the system can automatically report the status of its software to a ship software logging system (SSLS) as specified in the international standard ISO 24060.

2.10.7.2 Data links**2.10.7.2.1 General requirements for category II and III systems**

Loss of a data link shall be specifically addressed in risk assessment analysis/FMEA. See 2.10.4.2.3.

- .1 A single failure in data link shall not cause loss of vessel- functions of category III. Any effect of such failures shall meet the principle of fail-to-safe for the vessel-function(s) being served.
- .2 For vessel-functions of category II and III, any loss of functionality in the remote control system shall be compensated for by local/manual means.
- .3 The data link shall have means to prevent or cope with excessive communication rates.
- .4 Data links shall be self-checking, detecting failures or performance issues on the link itself and data communication failures on nodes connected to the link.
- .5 Detected failures shall initiate an alarm.

2.10.7.2.2 Specific requirements for wireless data links

- .1 Category III systems shall not use wireless data links unless specifically considered by the *Register* on the basis of an engineering analysis carried out in accordance with an International or National Standard acceptable to the *Register*.
Other categories of systems may use wireless data links with the following requirements:
- .2 Recognised international wireless communication system protocols shall be employed, incorporating:
 - a. Message integrity. Fault prevention, detection, diagnosis, and correction so that the received message is not corrupted or altered when compared to the transmitted message.
 - b. Configuration and device authentication. Shall only permit connection of devices that are included in the system design.
 - c. Message encryption. Protection of the confidentiality and or criticality of the data content.
 - d. Security management. Protection of network assets, prevention of unauthorized access to network assets.
- .3 The internal wireless system within the vessel shall comply with the radio frequency and power level requirements of International Telecommunication Union and flag state requirements.
- .4 Consideration should be given to system operation in the event of port state and local regulations that pertain to the use of radio-frequency transmission prohibiting the operation of a wireless data communication link due to frequency and power level restrictions.

.5 For wireless data communication equipment, tests during harbour and sea trials are to be conducted to demonstrate that radio-frequency transmission does not cause failure of any equipment and does not self-fail as a result of electromagnetic interference during expected operating conditions.

2.10.7.3 Verification of technical requirements by the Register

The implementation of the technical requirements provided in 7 is verified by the Register as part of the system description (2.10.4.2.3), FAT (2.10.4.2.7) and SAT (2.10.4.3.6) described above.

ANNEX A: SUMMARY OF DOCUMENTATION SUBMITTAL

Table 1 and Table 2 below summarise the documentation to be submitted to the Register.

Table 1
Summary of documentation submittal by the system supplier

Paragraph reference	Item Document	Responsible role	System category		
			Cat I	Cat II	Cat III
2.10.4.2.1	Quality plan	System supplier	-	FI on req.	FI on req.
2.10.4.2.3	System description	System supplier	FI on req.	AP	AP
2.10.4.2.4	Environmental compliance	System supplier	FI on req.	FI	FI
2.10.4.2.5	Software test reports	System supplier	-	FI on req.	FI on req.
2.10.4.2.6	System test report	System supplier	-	FI on req.	FI on req.
2.10.4.2.7	FAT program	System supplier	-	AP	AP
2.10.4.2.7	FAT report	System supplier	-	FI	FI
2.10.4.2.7	Additional FAT docs. (e.g. user manual, etc)	System supplier	-	FI on req.	FI on req.
2.10.4.2.8	Management of change procedure	System supplier	-	FI on req.	FI on req.

Legend: AP = Approval, FI = For Information, “-“ = No requirement, on req. = Upon request from the Register

Table 2
Summary of documentation submittal by the systems integrator

Paragraph reference	Item Document	Responsible role	System category		
			Cat I	Cat II	Cat III
2.10.4.3.2	Quality plan	Systems integrator	-	FI on req.	FI on req.
2.10.4.3.3	List of system categorizations	Systems integrator	AP on req.	AP on req.	AP on req.
2.10.4.3.4	Risk assessment report	Systems integrator	AP on req.	AP on req.	AP on req.
2.10.4.3.5	Vessel’s system architecture	Systems integrator	FI on req.	FI on req.	FI on req.
2.10.4.3.6	SAT program	Systems integrator	-	AP	AP
2.10.4.3.6	SAT report	Systems integrator	-	FI	FI
2.10.4.3.7	SOST program	Systems integrator	-	AP	AP
2.10.4.3.7	SOST report	Systems integrator	-	FI	FI
2.10.4.3.8	Change management procedure for software	Systems integrator	-	FI on req.	FI on req.

Legend: AP = Approval, FI = For Information, “-“ = No requirement, on req. = Upon request from the Register

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ANNEX B: SUMMARY OF TEST WITNESSING AND SURVEY

Table 3 below summarises the activities that shall be witnessed or surveyed by the Register.

The responsible role shall facilitate the activity.

Table 3

Summary of test witnessing and survey

Item		Responsible role	System category		
Paragraph reference	Activity		Cat I	Cat II	Cat III
2.10.4.2.7	FAT witnessing	System Supplier	-	x	x
2.10.4.3.6	SAT witnessing	Systems integrator	-	x	x
2.10.4.3.7	SOST witnessing	Systems integrator	-	x	x
2.10.6.12	Verification of changes	Systems integrator	-	x	x

Legend: "x" = Witnessing required, "-" = Witnessing not required

■ New **Head 2.12 CYBER RESILIENCE** has been added and should be read as follows:

2.12 CYBER RESILIENCE

2.12.1 General

2.12.1.1 The following vessels shall comply with the requirements as stated in the *Rules for the classification of ships, Part 1 – General requirements, Chapter 6 – Requirements for additional class notations, Section 6 – Cyber resilience, 6.2:*

- Passenger ships (including passenger high-speed craft) engaged in international voyages
- Cargo ships of 500 GT and upwards engaged in international voyages
- High speed craft of 500 GT and upwards engaged in international voyages
- Mobile offshore drilling units of 500 GT and upwards
- Self-propelled mobile offshore units engaged in construction (i.e. wind turbine installation maintenance and repair, crane units, drilling tenders, accommodation, etc.)

2.12.1.2 System and equipment under scope of 2.12.1.1 shall comply with requirements as stated in the *Rules for the classification of ships, Part 1 – General requirements, Chapter 6 – Requirements for additional class notations, Section 6 – Cyber resilience, 6.3.*

9 EMERGENCY SOURCE OF ELECTRICAL POWER

■ **Head 9.5 – STARTING ARRANGEMENTS FOR EMERGENCY DIESEL GENERATORS**, new item 9.5.6 has been added and should be read as follows:

9.5.6 For engine starting batteries of the Valve Regulated Lead Acid (VRLA) type for emergency generators, which due to their non-frequent use, are typically arranged with float charging to maintain a full charge state of the batteries over long periods of time see IACS Recommendation No. 178 - Recommendation for Valve Regulated Lead Acid (VRLA) Starting Batteries of Emergency Generators