Tasneef
هيئة الإمارات للتصنيف
Emirates Classification Society

Guide for the Ship Condition Assessment Program (CAP)

Effective from 1 January 2025

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Tasneef®
MARITIME

GENERAL CONDITIONS

Definitions:

Administration" means the Government of the State whose flag the ship is entitled to fly or under whose authority the ship is authorized to operate in the specific case.

"**IACS**" means the International Association of Classification Societies.

"Interested Party" means the party, other than the Society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the shipbuilder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.

"**Owner**" means the registered owner, the shipowner, the manager or any other party with the responsibility, legally or contractually, to keep the ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2 of the Rules for the Classification of Ships or in the corresponding rules indicated in the Specific Rules.

"**Rules**" in these General Conditions means the documents below issued by the Society:

(i) Rules for the Classification of Ships or other special units.
(ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
(iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations.
(iv) Guides to carry out particular activities connected with Services;
(v) Any other technical document, for example, rule variations or interpretations.

"Services" means the activities described in paragraph 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.

"**Ship**" means ships, boats, craft and other special units, for example, offshore structures, floating units and underwater craft.

"Society" or "TASNEEF" means TASNEEF Maritime

"**Surveyor**" means technical staff acting on behalf of the Society in performing the Services.

"**Force Majeure**" means damage to the ship; unforeseen inability of the Society to attend the ship due to government restrictions on right of access or movement of personnel; unforeseeable delays in port or inability to discharge cargo due to unusually lengthy periods of severe weather, strikes or civil strife; acts of war; or other force majeure.

1. Society Roles

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:
(i) sets forth and develops Rules.
(ii) publishes the Register of Ships.
(iii) Issues certificates, statements and reports based on its survey activities.
1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.
1.3. The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which is regulated by these general conditions unless expressly excluded in the particular contract.

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2. Rule Development, Implementation and Selection of Surveyor

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published therefore, the Society, although also committed through its research and development services to continuous updating of the Rules, does not guarantee the Rules meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.
2.2. The Interested Party is required to know the Rules based on which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification.
The Rules for Classification of Ships are published on the Society's website: www.tasneef.ae.
2.3. Society exercises due care and skill:
(i) In the selection of its Surveyors
(ii)In the performance of its Services, taking into account the level of its technical knowledge at the time the Services are performed.
2.4. Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of the Ship or the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

3. Class Report & Interested Parties Obligation

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).
The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.
3.2. No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorized bodies and no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties based on the statements or information given by the Society.
The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, is governed by the Rules of the Society, which is the sole subject entitled to make such interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.
3.3. The classification of a Ship or the issuance of a certificate or other document connected with classification or certification and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness, structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

3.4. Any document issued by the Society about its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.
3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, shipbuilders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the ship Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.
In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.
In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third-party claim, as well as from any liability about the latter concerning the Services rendered.
Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties concerning the services rendered by the Society are described in the Rules applicable to the specific service rendered.

4. Service Request & Contract Management

4.1. Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

4.2 In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested.

4.3 The contractor for the classification of a ship or for the services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30/60/90 days' notice, to be given in writing. Failure to pay, even in part, the fees due for services carried out by the society will entitled the society to immediately terminate the contract and suspend the service.
For every termination of the contract, the fees for the activities performed until the time of the termination shall be owned to the society as well as the expenses incurred in view of activities already programmed, this is without prejudice to the right to compensation due to the society as a consequence of the termination.
With particular reference to ship classification and certification, unless decided otherwise by the society, termination of the contract implies that the assignment of class to a ship is withheld or, if already assigned, that it is suspended or withdrawn, any statutory certificates issued by society will be withdrawn in those cases where provided for by agreements between the society and the flag state.

5. Service Accuracy

5.1. In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see **Rule Development, Implementation and Selection of Surveyor** 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

6. Confidentiality & Document sharing

6.1. All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorization of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.
Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.

6.2. Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 below, the Society's clients hereby accept that the Society may participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.
6.3. In the event of transfer of class, addition of a second class or withdrawal from a double/dual-class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file, as the other Classification Society may require for classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained about the provision of plans and drawings to the new Society, either by way of the appropriate stipulation in the building contract or by other agreement.
In the event that the ownership of the ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

7. Health, Safety & Environment

7.1. The clients such as the designers, shipbuilders, manufacturers, repairers, suppliers, contractors or sub-contractors, or other product or system surveyed who have a registered office in ABU Dhabi; should have an approved OSHAD as per Abu Dhabi OHS Centre, or, if they do not need to have an approved OSHAD, they shall comply with TASNEEF standards and have procedures in place to manage the risks from their undertakings.

7.2. For the survey, audit and inspection activities onboard the ship, the ship's owner, the owner representative or the shipyard must follow TASNEEF rules regarding the safety aspects.

8. Validity of General Conditions

8.1. Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

9. Force Majeure

9.1 Neither Party shall be responsible to the other party for any delay or failure to carry out their respective obligations insofar as such delay and failure derives, directly or indirectly, and at any time, from force majeure of any type whatsoever that lies outside the control of either Party.

9.2 The Party that is unable to fulfil the agreement due to Force Majeure shall inform the other party without delay and in all cases within 7 days from when such force majeure arose.

9.3 It is understood that if such force majeure continues for more than 30 days, the Party not affected by the event may terminate this agreement by registered letter. The rights matured until the day in which the force majeure occurred remain unaffected.

10. Governing Law and Jurisdiction

This Agreement shall be governed by and construed in accordance with the laws of Abu Dhabi and the applicable Federal Laws of the UAE.
Any dispute arising out of or in accordance with this Agreement shall be subject to the exclusive jurisdiction of the Abu Dhabi courts.

11. Code of Business conduct

The **CLIENT** declares to be aware of the laws in force about the responsibility of the legal persons for crimes committed in their interest or to their own advantage by persons who act on their behalf or cooperate with them, such as directors, employees or agents.
In this respect, the **CLIENT** declares to have read and fully understood the "**Ethical Code**" published by **TASNEEF** and available in the **TASNEEF** Web site.
The **CLIENT**, in the relationships with **TASNEEF**, guarantees to refrain from any behaviour that may incur risk of entry in legal proceedings for crimes or offences, whose commission may lead to the enforcement of the laws above.
The **CLIENT** also acknowledges, in case of non-fulfilment of the previous, the right of **TASNEEF** to unilaterally withdraw from the contract/agreement even if there would be a work in progress situation or too early terminate the contract/agreement. It's up to **TASNEEF** to choose between the two above mentioned alternatives, and in both cases a registered letter will be sent with a brief sum-up of the circumstances or of the legal procedures proving the failure in following the requirements of the above-mentioned legislation.

In light of the above, it is forbidden to all employees and co-operators to:
- receive any commission, percentage or benefits of any possible kind;
- Start and maintaining any business relationship with **Clients** that could cause conflict of interests with their task and function covered on behalf of **TASNEEF.**
- Receive gifts, travel tickets or any other kind of benefits different from monetary compensation, that could exceed the ordinary business politeness.

Violation of the above-mentioned principles allows **TASNEEF** to early terminate the contract and to be entitled to claim compensation for losses if any.

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1 GENERAL

The aim of this guide is to provide Interested Parties with the criteria followed by Tasneef to carry out a Condition Assessment Program (CAP) in order to assign a rating based on the condition of a ship, independently of its classification. However, it is normally carried out for ships classed by Tasneef.

The CAP is based on visual inspections of structures, thickness measurements, structural calculations, inspections and tests of systems, machinery and equipment.

The rating assigned to the ship and the report issued following the CAP survey are entirely based on what is found at the time of the verification.

The CAP report, provided to the Interested Party, contains a detailed description of the ship's condition at the time of the survey.

The ship's condition is normally assessed for the whole hull structure, machinery and equipment according to a rating system comprising four levels, from 1 to 4, where 1 is the highest score. However, the condition could be assessed for and the rating could be assigned to single parts of the ship, if so agreed with the Interested Party.

Tasneef criteria can be complemented by and/or adjusted to particular requirements addressed by the Interested Parties, e.g. for charter purpose, underwriters' clause, oil majors.

2 FIELD OF APPLICATION

This guide applies, outside the scope of classification, at the request of the Interested Party, to oil and chemical tankers, gas carriers or other ships for which there are no other specific Tasneef guides, with the scope of issuing a "Condition Assessment Program (CAP)" report.

3 DEFINITIONS

"CAP" means Condition Assessment Program.

"CAP survey" means inspections, tests, checks and structural assessment carried out within the scope of the CAP.

"ESP" means the Enhanced Survey Program established in IMO Resolution MSC.461(101), as amended, in IACS UR Z.10.1, Z.10.2, Z.10.3, Z.10.4 and Z.10.5 and in the relevant Rules.

"Interested Party" means the ship Owner or management company requesting Tasneef to carry out a CAP survey.

"Rules" means the Rules for the Classification of Ships in force at the time of the CAP survey.

"As-built scantlings" means the scantlings indicated in the drawings for the ship at the time of construction.

"As-gauged scantlings" means the scantlings derived from thickness measurements taken at the time of the survey.

"Rule scantling" means the scantling required by the Rules.

"Substantial corrosion" is an extent of corrosion such that the assessment of the corrosion pattern indicates a wastage in excess of 75% of the allowable margins but within acceptable limits.

"Suspect area" means a location showing substantial corrosion and/or considered by the Surveyor to be prone to rapid wastage.

"UTM" means ultrasonic thickness measurements.

"Double Hull Oil Tanker" is a ship which is constructed primarily for the carriage of oil in bulk, which has the cargo tanks protected by a double hull that extends for the entire length of the cargo area, consisting of double sides and double bottom spaces for the carriage of water ballast or void spaces.

4 CAP RATING SYSTEM

The condition of a ship is assessed according to the following rating system.

4.1 HULL STRUCTURES

4.1.1 Structural condition rating

1 **"VERY GOOD CONDITION"**

Items examined and measured, found with only superficial reductions from "as new" or current Rule scantlings. No maintenance or repair required.

2 **"GOOD CONDITION"**

Items examined and measured, found to have deficiencies of a minor nature not requiring correction or repairs and/or found to have thicknesses significantly above class limits.

3 **"SATISFACTORY CONDITION"**

Items examined and measured either found to have deficiencies which do not require immediate corrective actions, or found to have thicknesses which, although generally above class renewal levels, have areas of substantial corrosion.

4 **"POOR CONDITION"**

Items examined and measured either found to have deficiencies which may affect the ship's potential to remain in class, or found in some areas to have thicknesses that are at or below the class renewal levels.

4.1.2 Coating rating[1]

1 **"GOOD CONDITION"**

Coating condition with only minor spot rusting (corresponding to the definition "good" according to ESP criteria).

2 **"FAIR CONDITION"**

Coating condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20% or more of the areas under consideration, but less than that defined for poor condition (corresponding to the definition "fair" according to ESP criteria).

3 **"SATISFACTORY CONDITION"**

Coating condition with general breakdown of coating over 20% or more of areas or hard scale in 10% or more of areas under consideration (corresponding to the definition "poor" according to ESP criteria) or where the spaces are not coated and, in both cases, provided with cathodic means against corrosion or equivalent systems.

4 **"POOR CONDITION"**

Coating condition with general breakdown of coating over 20% or more of areas or hard scale in 10% or more of areas under consideration (corresponding to the definition "poor" according to ESP criteria) or when the spaces are not coated.

4.2 MACHINERY AND SYSTEMS

1 **"VERY GOOD CONDITION"**

Items and systems examined and function tested, found with no deficiencies affecting safe operation and/or performance. Documentation and maintenance practices considered good. No maintenance or repair required.

2 **"GOOD CONDITION"**

Items and systems examined and function tested, found with some minor deficiencies which do not affect safe operation and/or normal performance. Documentation and maintenance practices considered adequate. No immediate maintenance or repair considered necessary.

3 **"SATISFACTORY CONDITION"**

Items and systems examined and function tested, found with deficiencies not affecting safe operation and/or performance. Documentation and maintenance practices considered of a minimum standard. Some maintenance and repair may be considered necessary.

4 **"POOR CONDITION"**

Items and systems examined and function tested, found with deficiencies significantly affecting operation and/or performance. Documentation and maintenance practices considered inadequate. Maintenance and repair required to reinstate serviceability.

5 SCOPE OF THE CAP SURVEY

The CAP survey is to be carried out, at the Interested Party's request, by exclusive Tasneef Surveyors qualified for ESP surveys, at a class renewal or intermediate survey, or during a docking survey (inclusive of in-water survey in lieu of docking).

For a ship classed by Tasneef, items within the scope of the class survey inspected during the CAP survey and found in satisfactory condition can be credited also with respect to the class survey, when both are due.

If the CAP survey reveals that some items subject to class do not comply with the Rules, e.g. in terms of coating condition, substantial corrosion or suspect areas found during the close-up survey or hot spot items arising from fatigue analysis, corrective actions are required by Tasneef in accordance with the current classification procedures.

If the CAP service is requested by the Interested Party for a ship not classed by Tasneef, the Interested Party is responsible for informing the class Society accordingly. The Interested Party is also responsible for communicating to the Classification Society any recommendation arising from the CAP survey which is relevant to class.

6 DOCUMENTATION REQUIREMENTS

The Interested Party is to submit the following documentation to Tasneef (if not available in the Tasneef file), at the time of the request and in order to plan the CAP survey:

a) Drawings showing the as-built scantlings, including at least:
   - general arrangement plan
   - capacity plan
   - midship section
   - shell expansion
   - construction profile plan
   - transverse and longitudinal bulkheads
   - fore peak/aft peak structure;

b) Approved maximum still water bending moments;
c) History of steel renewal and last UTM reports;
d) Previous CAP hull reports for the vessel or sister vessel(s) (if any);
e) Fatigue Report (if any);
f) Executive Hull Summary;

[1] No rating is foreseen for stainless or not coated cargo tanks

g) Hull Survey Programme;
h) Class Status Report (Historical with previous and present Conditions of Class Memos to Owner, Memo to Surveyor and Hull Damage Records).

7 CAP PROCEDURE

7.1 General

The procedure for carrying out the CAP survey hereinafter detailed is applicable to both ships classed with Tasneef and not.
Possible specific requirements and criteria may be addressed by the Interested Parties (e.g. for charter purpose, underwriters' clause, oil majors) and applied in addition or as partial modification of the Tasneef procedure.
In case, such requirements and criteria are to be timely declared by the Interested Party to allow proper planning and arrangement for the CAP survey and relevant reporting.

Historical record review and fatigue study are to be available before the Surveyor attends the ship.

7.2 Hull structures

7.2.1 Check of ship's damage, repair and classification records

The check of the ship's records relevant to classification, damage and repair, steel renewals and UTM reports is to be carried out in order to address the following close-up surveys, taking into account possible suspect areas, areas with substantial corrosion, items identified by preliminary strength calculations and hot spot items arising from the fatigue analysis.

7.2.2 Critical Structural Areas

"Critical Structural Areas" are locations which have been identified from calculations or from the service history of the subject ship or from similar or sister ships as being sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

Such areas require special monitoring and are to be specially considered during the CAP survey.

In particular, meaningful photos of such areas are to be included in the report.

7.2.3 Preliminary strength assessment (based on as-built scantlings)

The preliminary hull girder and local strength assessment is carried out on the basis of the as-built scantlings and compared with respect to the Rule requirements for new buildings, by using the Tasneef LEONARDO HULL program.

7.2.4 Fatigue analysis

The fatigue analysis of structural details is carried out according to the procedure specified in Part B, Ch 7, Sec 4 of the Rules.

This procedure is based on the calculation of the fatigue damage originated by the fluctuating stresses induced in the detail by the hull girder and local wave loads, combined with the ballast and full load cargo conditions. The fatigue life of the detail is calculated from the fatigue damage.

The fatigue analysis is based on the following assumptions.

a) Cyclic wave loads are calculated considering the ship engaged in typical worldwide navigation, represented by the North Atlantic scatter diagrams provided by Global Wave Statistics. In this case, the coefficient ξ defined in Pt B, Ch 7, Sec 4 of the Rules is used.

   If the ship is engaged in trade voyages within specific geographic areas, the above coefficient ξ is calculated by means of the formula:

$$\xi = \frac{0{,}47}{\ln\frac{\sigma_8}{\sigma_5}}$$

   The long-term stresses σ_8 and σ_5, at a probability level of 10^{-8} and 10^{-5}, respectively, are obtained by means of seakeeping analyses based on the scatter diagrams representative of the relevant areas.

   In this case, the navigation areas are to be specified by the Owner and are indicated on the ship's Certificate of Classification.

b) The fluctuating stress ranges are calculated in the examined details as being originated by the hull girder and local wave loads in load cases "a", "b", "c" and "d", defined in the Rules, considering the ship in full load and ballast conditions.

   For the detail connections between longitudinal ordinary stiffeners and transverse primary supporting members (transverse bulkheads and web frames), the following contributions to the fluctuating stresses in the stiffeners are accounted for:

   - axial stresses due to the wave hull girder bending moments, vertical and horizontal,
   - bending stresses induced by the local wave loads supported by the stiffener,
   - for the connections with transverse bulkheads, additional bending stresses due to the relative deflections between the transverse bulkheads and the adjacent web frames (see Fig 1).

c) All the wave loads applied to the structural elements are multiplied by the relevant Partial Safety Factors defined in the Rules.

d) The stress ranges for the fatigue checks are calculated considering the structures with their net scantlings, explicitly to take into account the effects of corrosion.

e) The fatigue analysis is based on the notch stress ranges, i.e. the peak stress ranges in the root of the weld (see Fig 2). These peak stresses take into account the stress concentrations due to the presence of welds.

Notch stress ranges are obtained from the hot spot stress ranges (which account for the detail geometry, but not for the presence of welds) through coefficients defined in the Rules depending on the type of welding adopted.

Hot spot stresses are obtained from the nominal stresses by applying the Stress Concentration Factors (SCFs) defined in the Rules for the specific geometry of the connection.

Where no appropriate SCF values are available, the Rule specifies the procedure for calculating the hot spot stresses through a finite element analysis.

f) The notch stress ranges are multiplied by other coefficients that accounts for the following effects:

- reduction of the fatigue strength for thicknesses greater than 16 mm,
- increase of the stress range due to possible misalignment,
- in the case of ordinary stiffener connections, increase of the stress range because of the warping stresses that originate in the flange of unsymmetrical profiles.

g) The fatigue damage and the fatigue life are calculated taking into account the Partial Safety Factors on material and resistance, defined in the Rules.

Based on the above procedure, the fatigue life of the examined detail, in years, is obtained from the following formula:

$$f_L = \frac{20}{\gamma_R}\left(\frac{\Delta\sigma_{p0}}{\Delta\sigma_{N,eq}}\right)^3$$

(A) If the calculated fatigue life is between 17 years and 23 years, the item is identified as a “hot spot item” to be subjected to a close-up survey as part of the CAP survey

(B) If:

- the fatigue life is less than 17 years, or
- the calculated fatigue life is less than the actual ship life + 3, in years

the item is identified as a “hot spot item” to be inspected by a close-up survey at the time of the CAP survey.

When deemed necessary, a non-destructive examination, such as the dye penetrant test, may be required to be carried out during the close-up survey.

Figure 1: Additional bending stresses due to the relative deflections between transverse bulkheads and adjacent web frames

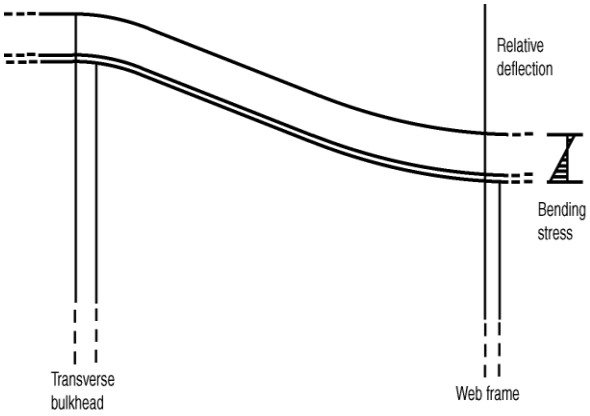
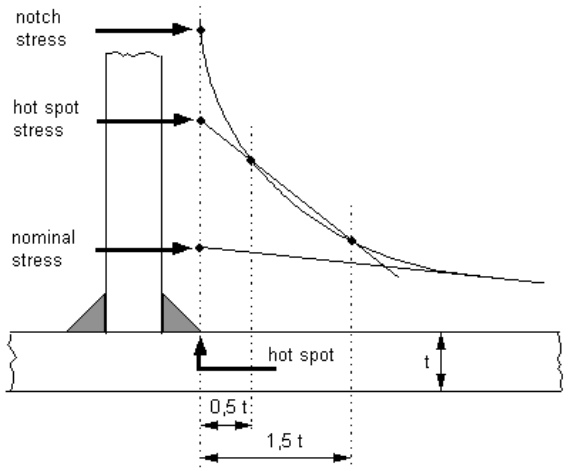


Figure 2: Types of stresses for the fatigue analyses



Fatigue analysis report will be prepared and released upon request only.
For ship not classed by Tasneef, the owner is in charge to inform the ship’s Classification Society about the outcome of the fatigue analysis. The matter will be evaluated by the ship’s Classification Society according to its own Rules.

7.2.5 Inspection

In general, all inspections are to be carried out within a period of not more than six months.

Different period may be agreed on a case-by-case basis.

Prior to the inspection, a meeting is to be arranged between the Interested Party’s representatives and the attending Tasneef Surveyor in order to discuss the conditions under which the inspections will be carried

out, means of access and methods for taking the thickness measurements.

In general, the inspection is to be carried out in dry dock. Tasneef may accept that the inspection is carried out afloat if the ship is anchored in sheltered waters in calm sea and good weather conditions.

The inspection is to be commenced by taking steel thickness measurements and conducting close-up surveys of the internal spaces.

It is the Interested Party's responsibility to ensure that the spaces to be inspected are properly cleaned, ventilated to maintain a safe atmosphere and lit. Provision is to be made to allow Surveyors to perform the planned close-up surveys and thickness measurements.

Inspections of internal spaces (outside the engine room area) are to be carried out in all ballast tanks (including aft and fore peak) and at least 30% of cargo spaces are to be close-up inspected. The remaining spaces are to be subjected to an overall inspection.

A selection of tanks for fuel oil and lube oil within the cargo length area will be accepted for examination. Depending on the outcome of the above-mentioned inspections, the extent of the close-up surveys may be increased to the Surveyor's satisfaction.

A dry dock or underwater inspection is to be conducted outside the engine room area, including the rudder and propeller.

It is to be checked that the Loading Manual and/or Loading Instrument are in accordance with the Rules and that the Master and the deck officers are familiar with them.

Photographs are to be taken to show the condition of the structure as found during the inspection and the improvement obtained as a consequence of steel renewals and/or repairs, if any. The photographs are to be part of the survey documentation and included in the final CAP report.

No rating will be assigned to not inspected items.

Extent of areas not inspected is to be listed in the report.

7.2.6 Thickness measurements

A qualified gauging firm is to carry out the thickness measurements to the extent necessary to calculate the actual structural strength of the ship.

The extent of the thickness measurements is to be discussed and agreed with the attending Tasneef Surveyor before their commencement.

Documentation of measurements carried out during the last 12 months may be taken into account for the purpose of planning the thickness measurements to be carried out during the CAP survey.

The extent of the thickness measurements may be reduced or extended, at the discretion of the attending Tasneef Surveyor, on the basis of the results of close-up surveys and evidence of thickness measurements taken during the inspection.

Thickness measurements are to be taken at least in the following areas:

a) For an oil tanker or a chemical tanker:
   1) Within the cargo length area:
      - Each deck plate.
      - Three transverse sections including all longitudinal members such as plating, longitudinal stiffeners and girders at the ship deck, side, bottom, inner bottom and longitudinal bulkheads.

        The above sections are to be chosen to include representative cargo and ballast tanks.
      - Three transverse bulkheads including plating, stiffeners and girders. The gaugings of stiffeners and main supporting members such as girders are to include both the web and flange thickness.
      - Three web frames including bottom, side, deck, longitudinal bulkhead and struts. The gaugings are to include both the web and the flange thickness. The above sections are to be chosen to include representative cargo and ballast tanks.
      - Each bottom plate.
      - All wind and water strakes.
      - Measurements of structural members subject to a close-up survey for general assessment and recording of the corrosion pattern.
   2) Outside the cargo area:
      - Selected wind and water strakes.

b) For other types of ships, the items to be checked are to be at least those required in Part A of the Rules for renewal surveys and for a ship's age > 15 years.

7.2.7 Strength assessment based on as-gauged scantlings

Upon verification of the measured scantlings, a strength evaluation based on measured thickness is carried out by Tasneef using the LEONARDO HULL program.

The hull girder section modulus W_M, calculated considering the as-gauged scantlings, is to be not less than 90% of the hull girder section modulus W_{AB} calculated considering the as-built scantlings. Where this check is not complied with, steel renewals of the continuous longitudinal elements in the deck and bottom zones are to be carried out as far as deemed necessary to fulfil the above-mentioned requirement.

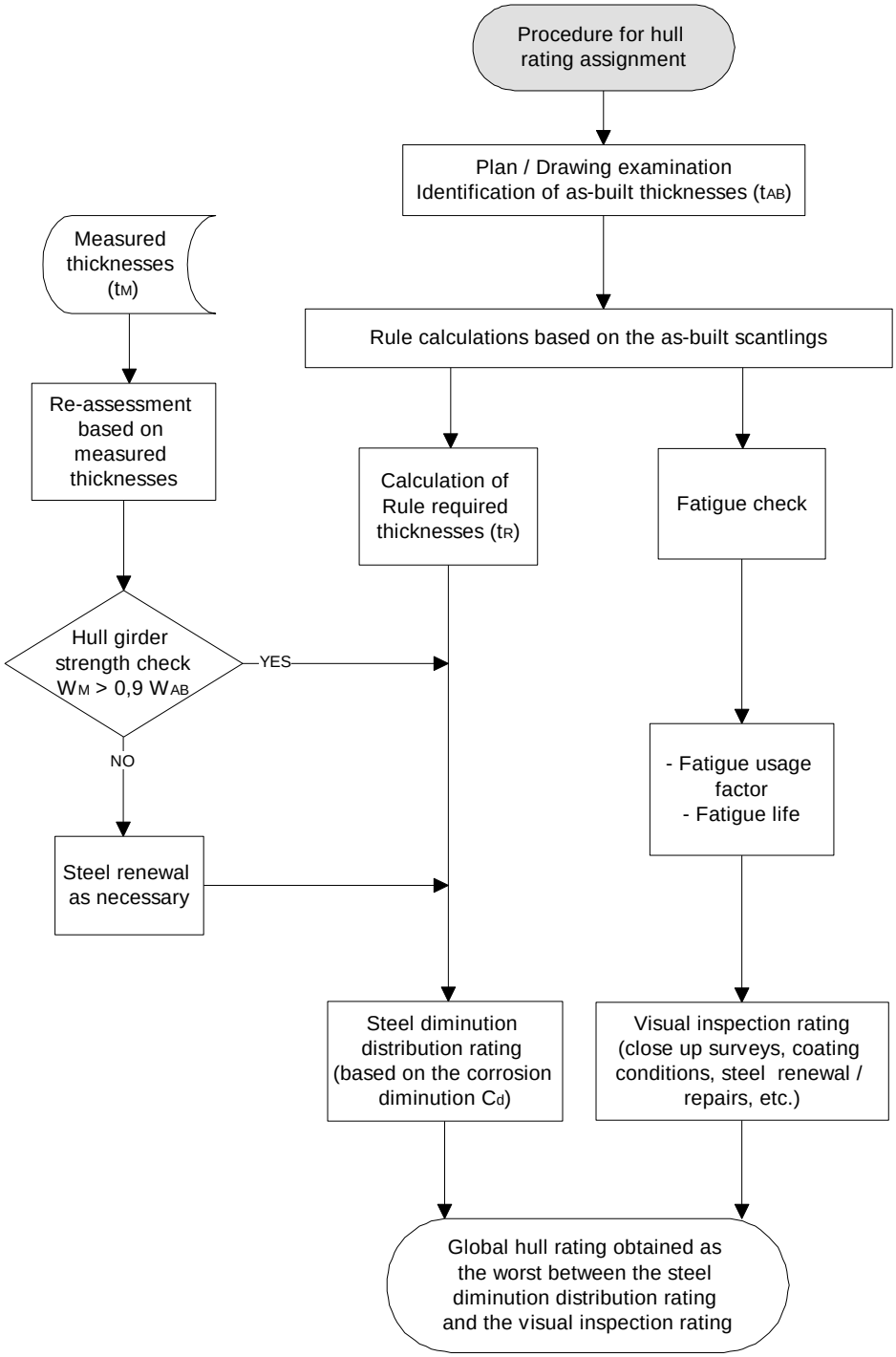
A local strength assessment of structural elements, including yielding and buckling of plates and stiffeners, is carried out on the basis of the as-gauged scantlings and Tasneef criteria for existing ships by means of the Tasneef LEONARDO HULL program.

7.2.8 Hull rating

The hull rating (see Fig 3) is assigned from the evaluation of the inspection rating (based on the strength assessment and fatigue analysis in [7.2.3] and [7.2.4], and derived from the inspections carried out according to [7.2.5]) and from the steel diminution rating (derived from the thickness measurements defined in [7.2.6] and the strength assessment based on as-gauged scantlings in [7.2.7]).

The overall hull rating is assigned as the visual inspection rating or the steel diminution distribution rating, whichever is the worse.

Figure 3: Flow chart of the procedure for assigning a rating to hull structures



7.2.8.1 Visual inspection rating

Further to the visual inspection, a rating is assigned according to the following criteria:

a) Structural condition rating

This consists of an assessment of the condition of the structure as regards damage, deformations, indents, buckling, cracks, wear and pitting.

The rating of each item is attributed according to the criteria indicated in [4.1.1].

The rating is assigned as the average of the ratings attributed to each structural item.

b) Coating rating

This consists of an assessment of the condition of the coating of the steel structures.

The rating of each item is attributed according to the criteria indicated in [4.1.2].

For each item inspected, the visual inspection rating is calculated as follows:

visual inspection rating = structural condition rating x 0,80 + coating rating x 0,20

The overall visual inspection rating is the average of the ratings attributed to all items inspected.

7.2.8.2 Steel diminution rating

The criteria for assigning the steel diminution rating to each structural element are indicated in Tab 1, where the steel diminution factor Cd is defined as the ratio of the thickness reduction due to corrosion to the allowable wastage limit for the element under consideration, calculated according to Pt A, Ch 2, App 2 of the Rules (see Fig 4).

Table 1: Rating for steel diminution

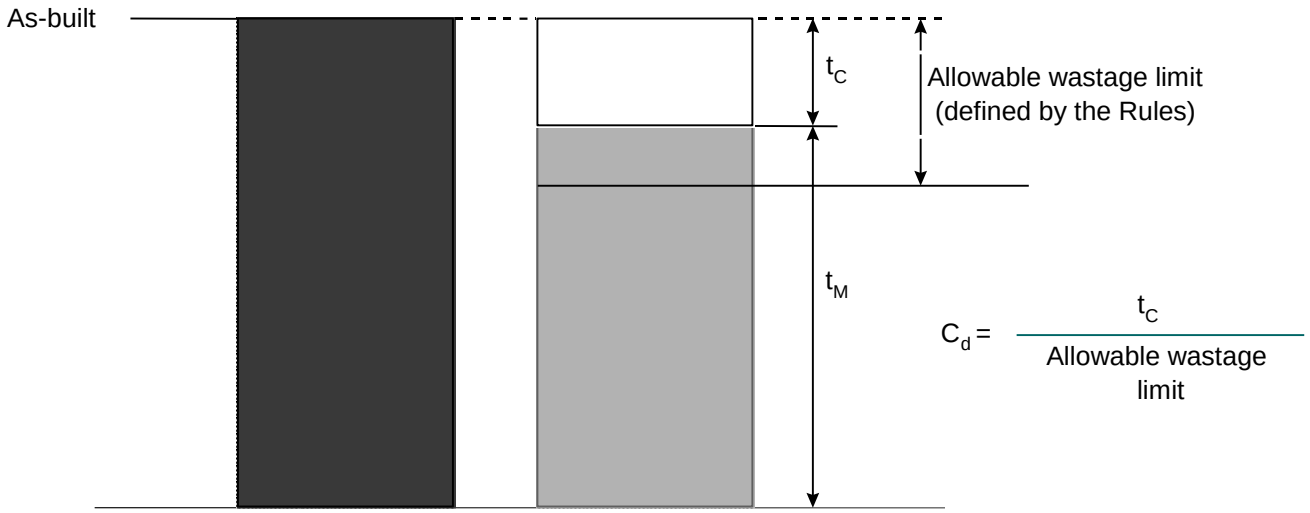
Steel diminution factor C_d	Rating
$0 \le C_d \le 1/3$	1
$1/3 < C_d \le 3/4$	2
$3/4 < C_d \le 1$	3
$C_d > 1$	4

When the as-built scantling of a structural element from the strength assessment in [7.2.3] is lower than the one required by the Rules for a new building, the relevant allowable wastage limits are reduced by the difference between the Rule required thickness t_R and the as-built scantling, as shown in Fig 5 below.

A cumulative distribution curve, as shown in the example in Fig 6, is derived by determining the steel diminution factor and associated rating of all structural elements contributing to the hull strength.

The overall steel diminution rating is assigned as the one corresponding to 90% of the readings (according to the example in Fig 6, the rating 2 is assigned).

Figure 4: Steel diminution factor C_d



t_c is the thickness diminution due to corrosion
t_M is the actual thickness as gauged
t_R is the required thickness according to the Rules

Figure 5: Corrosion diminution C_d

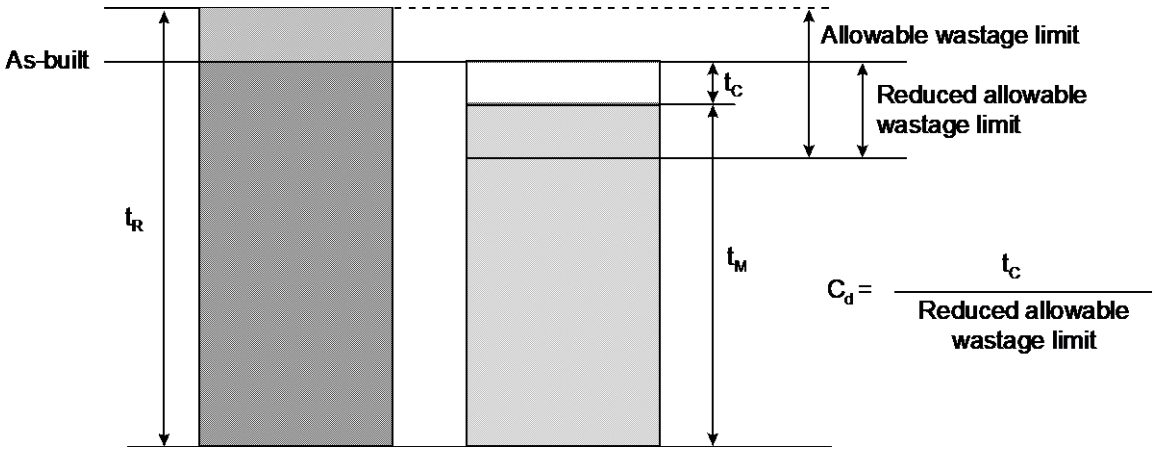
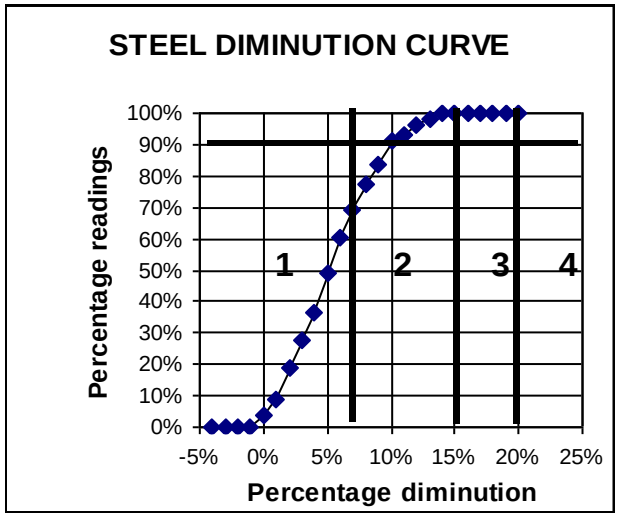


Figure 6: Cumulative steel diminution distribution curve



7.3 Machinery and systems

7.3.1 General

A general examination of machinery and systems, without requesting the opening of components unless deemed necessary on a case-by-case basis, is carried out as part of the CAP survey, paying attention to their overall condition and records of defects and functional tests.

The rating of each item inspected is attributed according to the criteria indicated in [4.2].

The overall machinery rating is assigned as the average of the ratings attributed to the different parts surveyed.

7.3.2 Machinery

The CAP survey of machinery includes:

a) general examination, including functional tests, of the main propulsion plant;

b) internal inspection of items opened for maintenance:
- for diesel engines, assessment of items such as crankcase, scavenge spaces, piston rings, bearing clearance, cylinder heads;
- the bearing clearance and gearing condition of steam turbines;
- boilers and economisers, where possible including the internal examination of water and gas spaces, and external examination of casing, burner equipment, blowers and safety valves;

c) oil sample of oil systems such as gearing, crankcase, sterntube, to be taken for analysis;

d) assessment of record of maintenance for items under PMS/CBM, when applicable.

7.3.3 Electrical installations

The CAP survey of electrical installations includes:

a) alternators under working conditions, both individually and during load sharing operations;

b) the fittings and equipment of the main and emergency switchboards, section boards and subsidiary distribution boards, including random tests of their safety devices;

c) records of insulation-resistance tests performed on cables, switchgear, generators, motors, heaters and lighting fittings, witnessing sample tests;

d) electrical cables, taking into account the aforementioned insulation resistance tests;

e) the emergency source of power, associated circuits and equipment, including testing under working conditions.

For tankers and in general for ships with dangerous zones and spaces, the integrity of “safe” type electrical equipment is to be assessed.

7.3.4 Auxiliary systems

The CAP survey includes the general examination including functional tests of auxiliary systems for propulsion, power generation, steering, fuel oil, lube oil, cooling water, compressed air, steam, ventilation and accommodation services.

Each system is to be examined having regard to the general condition, leakages, supporting instrumentation, emergency arrangements, etc.

Special consideration is to be given to the conditions of ECGS (Exhaust Gas Cleaning Systems) piping, especially overboard lines.

7.3.5 Safety protection devices

The various safety protection devices fitted to protect machinery and machinery spaces (alarms, shutdowns, standby pumps cut-in, remote stops, remote closing valves, bilge alarms, fire flaps, etc.) are to be assessed in order to verify their correct operation.

7.3.6 Other equipment

Anchor equipment, mooring systems, cargo gear and life-saving appliances are to be assessed by means of functional tests.

7.3.7 Plant performance in terms of environmental impact

Performance tests and assessments are to be carried out for all equipment that has an impact on the environment such as fuel management, lube oil leakages, air emission, bilge cleanness and oily water management.

7.3.8 Cargo and ballast systems

The CAP survey includes the inspection and testing of cargo related equipment and systems, including:

a) for tankers:

   cargo pumps and piping with associated installations such as inert gas plant, washing systems, level indication/sounding systems, venting systems, ballast pumps and piping, and remote closing valves;

b) for other types of ships:

   cargo equipment and closing devices, bilge, ballast and ventilation systems.

A functional test while the ship is trading (during loading or unloading in the harbour) will be requested depending on operational records, machinery technical conditions, maintenance carried out.

Special considerations to waive functional tests, will be given to cargo and ballast systems under CBM properly managed and documented or PMS for which good functional performance is confirmed by noise and vibration analysis of their main components.

In case of complete main machinery overhauling (e.g. main cargo and ballast pump overhauling), a functional test during loading and unloading operation is to be carried out to confirm the effectiveness of the maintenance carried out.

7.3.9 Specific system for LNG/LPG Carriers

Cargo containment system, cargo refrigeration system including pumps and compressors, blow-off system, venting system are to be examined and functional tested.

8 SURVEY REPORTING

The Surveyor in charge of the CAP survey is responsible for providing in the survey report an indication of the ratings assigned to structures and machinery items, based on his observations and the evaluation criteria provided in [4].

The Surveyor's report is to contain a detailed description of the survey findings, including photographs to show the best, worst and average conditions taken into consideration, and relevant upgrading works agreed with and carried out by the Interested Party.

9 SHIP'S OVERALL RATING

The ship's overall rating is assigned by combining the hull rating (weight 70%) with the machinery and system rating (weight 30%).

10 FINAL CAP REPORT

The results of the CAP Survey are summarised in the CAP report.

In line with the scope of the Condition Assessment Program, this report is to include the following:

a) introduction
b) executive summary
c) ship's description / main data / history
d) ship's structural history, including damages, repairs and steel renewals
e) details of hull surveys in each compartment, including photographs
f) details of machinery surveys for each component and system, including photographs
g) results of strength assessment and fatigue analysis
h) conclusions
i) references
j) Annexes, including the following:
   - ship's survey status
   - output of structural strength assessment and fatigue analysis based on as-built scantlings – with the indication of "hot spots"
   - UTM report (only for ships not classed by Tasneef)
   - details of repairs (if any)

- structural strength assessment based on as-gauged scantlings.

The ship's description in c) is to include unusual design features and a list of the implemented fuel saving devices (hull appendages, air lubrication, etc.).