



Rules for the Evaluation of a Reduced Conventional Age of Ships

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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 ship builder, 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 ship owner, 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, as for example rule variations or interpretations.

"Services" means the activities described in Article 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, as for example offshore structures, floating units and underwater craft.

"Society" or "TASNEEF" means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

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

Article 1

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 are regulated by these general conditions, unless expressly excluded in the particular contract.

Article 2

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 committed also 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 on the basis of 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. The 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 of 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.

Article 3

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 authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of 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 certificate on 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 in relation to 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, ship builders, 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 in relation to 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 with respect to the services rendered by the Society are described in the Rules applicable to the specific Service rendered.

Article 4

- 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. In the event of late payment, interest at the legal current rate increased by 1.5% may be demanded.

- 4.3. The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

For every termination of the contract, the fees for the activities performed until the time of the termination shall be owed 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 the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

Article 5

- 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 art. 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.

Therefore, except as provided for in paragraph 5.2 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

- 5.2. Notwithstanding the provisions in paragraph 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only). Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in paragraph 5.1 above.

- 5.3. Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

Article 6

- 6.1. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

- 6.2. However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

Article 7

- 7.1.** 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.
- 7.2.** Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, 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.
- 7.3.** 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 the purpose of 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 with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.
- 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.

Article 8

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

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1 INTRODUCTION

1.1 General

At the request of the Owner, after making the necessary checks, Tasneef may, for purposes other than classification, issue a statement containing the value of a reduction in conventional age derived from the application to a specific ship of the criteria given in these Rules.

These Rules contain a conventional age reduction calculation criterion following work, based on some simplified hypotheses illustrated below.

A ship which has undergone conversion, modification or renewal work and/or the ballast and cargo spaces have been given protective coatings has higher reliability characteristics over time than those the ship would have had, had it not undergone such work, and the same as those of a ship of lower age.

The difference between the original and the reduced age benefits the ship following the above-mentioned work.

The evaluation of this age reduction, even though only a rough approximation, is difficult to assess due to the considerable amount of information needed.

These Rules apply to those cases for which an approximation of results compatible with the above-mentioned hypotheses is requested.

1.2 Definition

In these Rules the term "ship" is used to identify any type of unit, propelled or not, irrespectively of the material used for its construction.

2 ASSUMPTIONS

The formulae presuppose the following assumptions.

2.1 General criteria

- The contribution to the conventional age reduction of the renewal of the machinery and plants and that of the renewal of the structures and/or their state of deterioration is in the ratio 40 to 60;
- the contribution to the conventional age reduction deriving from the introduction of new or renewed structures is proportional to the ratio between the weight of the renewed structures and that of the resistant hull structures after the conversion or modification ("resistant hull" is intended to mean the part of the hull situated below the strength deck, i.e. the part assumed in the structural calculations in the Rules);
- the contribution to the conventional age reduction deriving from the replacement or addition of machinery or plants is proportional to the importance of the machinery and plants renewed or added, evaluated according to conventional coefficients, relevant to all the machinery and plants on board at the end of the work;
- the contribution to the conventional age reduction derived from the application or renewal of the protective coating presupposes that the preparation of the structures is made according to the instructions of the Manufacturers of the coatings and that the coating is of the "hard" type. To be able to take advantage of a conventional age reduction, it is necessary to produce adequate documentation which specifies the foreseen duration of the coating, the thickness in mm, as well as the preparation required for the surfaces.

2.2 Machinery and plants

The formula acknowledges only the replacement of machinery or plants with new equipment.

All the other operations, including maintenance, repair and replacement of parts of machinery or plants, are considered normal operations for class retention. They do not influence the result of the formula. The only exception is the machinery engine, for which allowance is made for the replacement or renovation of some of its parts according to the table given in 4.2.

2.3 Hull

The maximum allowable wastage of the structures is that prescribed in relation to the conditions of applicability of these Rules referred to in (a), (b) or (c) of item 3.

Should the results of the thickness measurements, performed according to 4.3.1, highlight the existence of structures with greater thickness reductions, the premise for applicability of the Rules will cease to exist and therefore it will not be possible to calculate a conventional age reduction unless these structures are replaced. This is independent of whether such replacement is required or not for classification purposes.

3 CONDITIONS TO BE MET FOR APPLICATION OF THE FORMULAE

For the purpose of applying the formulae, at least one of the conditions in (a), (b) or (c) is to be met.

However, whichever of the three conditions is applied for the calculation of the conventional age reduction, the contribution, if any, of the other two conditions can also be taken into account, even if either of them, alone, does not meet the minimum requirements for application of the formulae.

(a) The main engines are replaced

The maximum wastage of the structures which are not involved in the conversion, modification or renewal work is not to exceed 75% of the wastage margin allowable for the purpose of classification.

(b) The conventional mass of the new or renewal structures evaluated according to 4.3.1 is equal to at least 20% of the resistant hull mass before the work is carried out

The maximum wastage of the structures which are not involved in the conversion, modification or renewal work is that referred to in (a).

In order to assess the magnitude of the conversion, work or modifications carried out on different occasions may be taken into consideration provided that the last check on the state of deterioration of the hull structures was performed after the most recent repairs.

In the case of structural renewals, at least 80% of the mass of new structures is to be located within the cargo and engine machinery areas and is to consist of the following structural elements:

- structures contributing to the longitudinal strength (deck, side, bottom plating, longitudinal stiffeners and relevant girders);
- structures contributing to the transverse strength (floors, side frames, beams and relevant stiffeners);

- bulkheads;
 - double bottom;
 - pillars, hatches and relevant accessories.
- If this last condition is not met, a corrective coefficient established on a case-by-case basis by Tasneef is to be included in the formula.

The condition relevant to the renewal of the hull equal to at least 20% of the resistant hull mass necessitates an evaluation of this latter mass.

For this purpose, the following criteria can be applied:
 (1) for ships built under Tasneef supervision, this hull mass is taken as that which results from the file data minus the superstructure mass. The latter is calculated using statistical methods if more precise data are unavailable.

- (2) for ships built without Tasneef supervision, two different cases (i) and (ii) have been identified:
 (i) Case in which data are available for similar ships built under Tasneef supervision.

- The resistant hull mass is calculated as follows:
- the value of the mass of the light weight is obtained from the ship's stability booklet
 - for similarity to a ship whose load exponent is available, the resistant hull mass of the ship in question is calculated using the following expression:

$$P'_{\text{hull}} = P_{\text{hull}} \times \frac{P'_{\text{light weight}}}{P_{\text{light weight}}}$$

where:
 $P'_{\text{hull}} \text{ e } P'_{\text{light weight}}$ = mass of the ship in question
 $P_{\text{hull}} \text{ e } P_{\text{light weight}}$ = mass of the similar ship for which the load exponent is available

- then the resistant hull mass is calculated using the same procedure as in A.

- (ii) Case in which data for similar ships built under Tasneef supervision are not available.

The resistant hull mass is determined by applying in full the statistical methods mentioned in (a).

Tasneef reserves the right to take into consideration calculations made on the basis of elements obtained from structural drawings.

(c) The ballast and cargo compartments have a protective coating whose effectiveness has been such as to maintain the residual thickness of the structures higher than 90% of the Rule thickness

The protective coating of the compartments can be applied after the ship has been built, for the purpose of applicability of these Rules, and, as far as concerns the ballast compartments, it can be of the hard, semi-hard or soft type

The coating is to be applied in accordance with the Manufacturer's instructions and, in any case, after the compartments to be coated have been completely

cleaned of muddy residues and rust flakes and the structures have been pressure washed.

In this connection, the compartments to be coated are to be inspected by a Tasneef Surveyor after cleaning and before the protective coating is applied; moreover, the pertinent documentation is to be made available to the Surveyor for review and acceptance. This documentation is to be attached to the report.

The coating applied is to be guaranteed by the supplier for at least three years.

If the cargo compartments have not been coated, Tasneef will determine on a case-by-case basis the applicability of these Rules in relation also to the types of cargo transported and to their corrosion aggressiveness on the structures. In such case, the residual thicknesses of the structures of the cargo compartments are to be higher than 90% of the original thicknesses.

The following checks are to be made:

- (1) survey of the ballast and cargo compartments to ascertain the presence and efficiency of the protective coatings against corrosion and the state of preservation of the protected structures;
- (2) thickness measurements as per Part A of the Rules for the Classification of Ships, for ships more than 15 years old and extended also to the following structures:
 - (i) collision bulkhead, inner bottom, bulkheads (lower and upper strake)
 - (ii) bulkhead stiffeners (vertical stiffeners and stringers)
 deck stiffeners (beams and longitudinals)
 side stiffeners (side frames and longitudinals)
 bottom stiffeners (floors, girders, ordinary stiffeners)
 structures of ends (fore and after peak structures).

The measurements in (2) (ii) above will be made on random samples.

Any renewals to bring the ship back to the conditions of applicability of this item (c) and the subsequent age reduction coefficient as per 4.3.1 (ii) will be evaluated on the basis of the above-mentioned surveys and thickness measurements.

When evaluating the ship's age reduction on account of the state of preservation of the structures [see 4.3.1 (ii)], at its discretion Tasneef may disregard corrosion up provided that the Rule scantlings are attained.

If, during the above-mentioned surveys, deficiencies emerge affecting the class (deformation, fractures, etc.), these are to be eliminated regardless of whether or not a Declaration of a conventional age reduction is issued.

4 CALCULATION OF A CONVENTIONAL AGE REDUCTION

4.1 Calculation of R

A conventional age reduction R, in years, is given by

$$R = E_0 - E_1$$

where:

E_0 = age of the ship from its date of construction

E_1 = new conventional age of the ship, obtained from the formula:

$$E_1 = E_0/100 [100 - (0,4 M + 0,6 S)]$$

where:

M = conventional age reduction coefficient relevant to the machinery plant, electrical plant, plants and machinery essential for safety, navigation and cargo service

S = conventional age reduction coefficient relevant to the hull structures.

The values of **M** and **S** are to be calculated as in 4.2 and 4.3.

In any case, however, the conventional age reduction **R** assignable to a ship cannot be more than 2/3 of the actual age of the ship at the time of the evaluation.

The value of E_1 or **R** obtained from the calculations or imposed by the limit indicated above is rounded up to the nearest integer.

4.2 Calculation of M

The value of **M** is given by the sum of the partial values **A+B+C** obtained by considering the following cases:

(a) Partial or total substitution of **m** in the **n** machinery engines including the auxiliaries needed for their operation

A = $Y m/n$ where **Y** is the coefficient given in the following table:

	Y
Complete replacement of the main engine	45
Adaptation of the main engine at subsequent stages of its development, researched and tested by the builder and accepted by Tasneef	15
Replacement of the crankshaft	5
Replacement of the framework	5

(b) Substitution of **m'** in the **n'** shaft lines and propellers of the ship

B = $5 m'/n'$

(c) Replacement or addition of one or more parts

C = $50 Q/R$

where:

Q = sum of the index numbers given in the table below relevant to each plant renewed or added,

R = sum of the index numbers given in the table below relevant to all the plants on board at the end of the work.

CONVENTIONAL INDEX NUMBERS OF IMPORTANCE OF THE VARIOUS PLANTS

Type of plant	Index number
Generating electric plant on board	16
Inert gas	10
Steering apparatus [1]	8
Bilge	8
Ballast	8
Fire protection (for each type of fixed plant including the water plant)	8
Compressed air	8
Fuel purification	8
Lubrication and purification oil - machinery engine	8
Auxiliary boilers	8
Cargo refrigerating plant	7
Capstans and winches	7
Cargo gear	7
Handling of liquid and/or gaseous cargo	7
Fuel transfer	7
Hydraulic plant, as per Part C of the Rules for the Classification of Ships	7
Air conditioning	3
Water distillation	3

[1] Steering gear and rudderstock included

For the purpose of application of the table, it is to be noted that the index numbers refer to all the components which make up the plants indicated therein.

For example, if the ship is equipped with 2 generators, the renewal of one of them results in the adoption of an index number = 8 for the purpose of calculating Q.

Furthermore, the addition of a generator leads to an index number equal to that of an existing generator increased in proportion to the reduction of the percentage of load for each generator. For example, if a third generator is added:

- percentage of load of each generator in the case of a plant consisting of 2 sets: 50% (index number of each generator 8)
- percentage of load of each generator in the case of an additional third set: 33%.

The index number relevant to the addition of a third generator will therefore be:

$$8 \times \frac{50}{33} = 12$$

- (d) The replacement of machinery, plants or parts thereof not included in the previous tables will be considered on a case-by-case basis.

4.3 Calculation of S

4.3.1 Renewal in a single stage

The value of **S** is given by:

$$S = S_1 + S_2 + S_3$$

- (i) **S₁** refers to the conversion, modification or renewal.

The following value is assumed for it:

$$S_1 = 100 P/P_0$$

in which:

P = mass of new or renewed structures in t. For bulk carriers, **P** is to be calculated by adding together the masses of each structure, new or renewed, multiplied by the coefficients given in the following table

P₀ = mass of the resistant hull after modification or transformation, in t

(in any case, the ratio **P/P₀** is not to be assumed greater than 1).

TABLE FOR THE CALCULATION OF THE MASS P FOR BULK CARRIERS

Type of new or renewed structure	Multiplicative coefficient of the mass of the structures
1 - Side shell in way of the holds and relevant side frames and brackets [1]	2,2
2 - Cargo hold transverse bulkheads	1,8
3 - Coamings and relevant hatch covers	1,6
4 - Top wing tank and hopper tank structures	1,4
5 - Cross deck	1,2
6 - Structures of the double bottom and all other structures	1
Note [1]: If more than 80% of the side frames and relevant upper and lower brackets are renewed, a value of the multiplicative coefficient of the mass of the structures equal to 4 is assumed.	

(ii) **S₂** refers to the state of deterioration of the structures which are not involved in the conversion or modification, if it is not higher than that in 2.3.

The following value is assumed for **S₂**:

$$S_2 = X (1-P/P_0) (1-N/E_0)$$

in which:

X = 90 for extent of thickness measurements as per Part A of the Tasneef Rules for ships of more than 15 years of age;

X = 45 for extent of thickness measurements as per Part A of the Tasneef Rules for ships between 10 and 15 years of age;

X = 0 for extent of thickness measurements as per Part A of the Tasneef Rules for ships of less than 10 years of age.

N = coefficient calculated as indicated below.

With a number of measurements deemed adequate by Tasneef, the mean value of the uniform corrosion is to be determined for each structural element.

If **C_i** is the mean value, in mm, of the uniform corrosion on the generic structural element "i" and if "**r_i**" is the annual thickness reduction, in mm/year, of standard uniform corrosion, obtained for that structural element from the table "Annual thickness reduction in standard corrosion", the relationship **K_i = C_i/r_i** is calculated for each element "i".

The value of **N** is given by the highest of the **K_i** relationships.

However, if some structures reveal considerable localised corrosion, these are to be renewed. Otherwise, **S₂** will need to be taken as equal to zero.

THICKNESS REDUCTION IN STANDARD UNIFORM CORROSION PER ANNUM

Structural elements	Type of ship	
	Dry cargo	Tanker
Upper deck [1]	0,08	0,13
Second deck [1]	0,06	-
Side shell at the wind and water line	0,10	0,13
Side shell not at the wind and water line	0,06	0,08
Inner bottom	0,08	-
Bottom shell	0,08	0,09
Transverse bulkheads in dry spaces:		
Lower and upper strake	0,12	-
Other strakes	0,08	-
Transverse bulkheads in non-dry spaces:		
Lower and upper strake	0,15	0,18
Other strakes	0,08	0,12
Lower and upper strake of longitudinal bulkheads	0,12	0,15
Other strakes	0,08	0,10
Bulkhead stiffeners in dry spaces	0,08	-
Bulkhead stiffeners in non-dry spaces	0,10	0,12
Upper deck stiffeners in dry spaces	0,08	-
Upper deck stiffeners in non-dry spaces	0,10	0,15
Side stiffeners in dry spaces	0,08	-
Side stiffeners in non-dry spaces	0,10	0,10
Bottom stiffeners and structures within the double bottom	0,10	0,15
Hatch coamings	0,08	-
Hatch covers	0,08	-

[1] For ro-ro type ships, the annual corrosion thickness reduction is to be assumed equal to 0,12 mm/year for the ro-ro decks.

(iii) S_3 refers to the application of "hard" type coatings to the structures.

$$S_3 = [C_1 (V_C / V_{tot}) + C_2 (V_Z / V_{tot})] (100 - S_1 - S_2)$$

V_C = volume of cargo spaces subjected to protective coatings

V_Z = volume of ballast spaces subjected to protective coatings

V_{tot} = total volume of ballast and cargo spaces

C_1, C_2 = coefficients as per the table

	C_1	C_2
Tankers and bulk carriers if the protective coating is applied when the residual thicknesses are equal to or higher than 95% of the prescribed thicknesses	1	1
Tankers and bulk carriers if the protective coating is applied when the residual thicknesses are less than 95% of the prescribed thicknesses	0,7	0,7
General cargo ships, ro-ros, etc. if the protective coating is applied when the residual thicknesses are equal to or higher than 95% of the prescribed thicknesses	0,7	1
General cargo ships, ro-ros, etc. if the protective coating is applied when the residual thicknesses are less than 95% of the prescribed thicknesses	0,5	0,7

4.3.2 Renewal in different stages

The values of S is calculated in connection with the various stages taking $S_2 = 0$. Only when calculating S corresponding to the last stage is the value of S_2 taken into account, calculated as described in 4.3.1, and taking the total weight of the new structures as the value of P .

NOTE: The total conventional age reduction for renewals carried out in several stages is the sum of the partial conventional age reductions calculated at the various stages.