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Tanker Plus
-
Inland Navigation Vessels

February 2013

Guidance Note
NI 601 DNI R00 E

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The accreditation certificate
is available on NR217, Part A

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BUREAU VERITAS

MARINE DIVISION
GENERAL CONDITIONS

ARTICLE 1

1.1. - BUREAU VERITAS is a Society the purpose of whose Marine Division (the "Society") is the classification (" Classification ") of any ship or vessel or structure of any type or part of it or system therein collectively hereinafter referred to as a "Unit" whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsea or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

The Society:

- prepares and publishes Rules for classification, Guidance Notes and other documents ("Rules");
- issues Certificates, Attestations and Reports following its interventions ("Certificates");
- publishes Registers.

1.2. - The Society also participates in the application of National and International Regulations or Standards, in particular by delegation from different Governments. Those activities are hereafter collectively referred to as " Certification ".

1.3. - The Society can also provide services related to Classification and Certification such as ship and company safety management certification; ship and port security certification, training activities; all activities and duties incidental thereto such as documentation on any supporting means, software, instrumentation, measurements, tests and trials on board.

1.4. - The interventions mentioned in 1.1., 1.2. and 1.3. are referred to as " Services ". The party and/or its representative requesting the services is hereinafter referred to as the " Client ". **The Services are prepared and carried out on the assumption that the Clients are aware of the International Maritime and/or Offshore Industry (the "Industry") practices.**

1.5. - The Society is neither and may not be considered as an Underwriter, Broker in ship's sale or chartering, Expert in Unit's valuation, Consulting Engineer, Controller, Naval Architect, Manufacturer, Shipbuilder, Repair yard, Charterer or Shipowner who are not relieved of any of their expressed or implied obligations by the interventions of the Society.

ARTICLE 2

2.1. - Classification is the appraisement given by the Society for its Client, at a certain date, following surveys by its Surveyors along the lines specified in Articles 3 and 4 hereafter on the level of compliance of a Unit to its Rules or part of them. This appraisement is represented by a class entered on the Certificates and periodically transcribed in the Society's Register.

2.2. - Certification is carried out by the Society along the same lines as set out in Articles 3 and 4 hereafter and with reference to the applicable National and International Regulations or Standards.

2.3. - **It is incumbent upon the Client to maintain the condition of the Unit after surveys, to present the Unit for surveys and to inform the Society without delay of circumstances which may affect the given appraisement or cause to modify its scope.**

2.4. - The Client is to give to the Society all access and information necessary for the safe and efficient performance of the requested Services. The Client is the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out.

ARTICLE 3

3.1. - **The Rules, procedures and instructions of the Society take into account at the date of their preparation the state of currently available and proven technical knowledge of the Industry. They are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.**

Committees consisting of personalities from the Industry contribute to the development of those documents.

3.2. - The Society only is qualified to apply its Rules and to interpret them. Any reference to them has no effect unless it involves the Society's intervention.

3.3. - The Services of the Society are carried out by professional Surveyors according to the applicable Rules and to the Code of Ethics of the Society. Surveyors have authority to decide locally on matters related to classification and certification of the Units, unless the Rules provide otherwise.

3.4. - **The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not in any circumstances involve monitoring or exhaustive verification.**

ARTICLE 4

4.1. - The Society, acting by reference to its Rules:

- reviews the construction arrangements of the Units as shown on the documents presented by the Client;
- conducts surveys at the place of their construction;
- classes Units and enters their class in its Register;
- surveys periodically the Units in service to note that the requirements for the maintenance of class are met.

The Client is to inform the Society without delay of circumstances which may cause the date or the extent of the surveys to be changed.

ARTICLE 5

5.1. - The Society acts as a provider of services. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty.

5.2. - The certificates issued by the Society pursuant to 5.1. here above are a statement on the level of compliance of the Unit to its Rules or to the documents of reference for the Services provided for.

In particular, the Society does not engage in any work relating to the design, building, production or repair checks, neither in the operation of the Units or in their trade, neither in any advisory services, and cannot be held liable on those accounts. Its certificates cannot be construed as an implied or express warranty of safety, fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

5.3. - The Society does not declare the acceptance or commissioning of a Unit, nor of its construction in conformity with its design, that being the exclusive responsibility of its owner or builder, respectively.

5.4. - The Services of the Society cannot create any obligation bearing on the Society or constitute any warranty of proper operation, beyond any representation set forth in the Rules, of any Unit, equipment or machinery, computer software of any sort or other comparable concepts that has been subject to any survey by the Society.

ARTICLE 6

6.1. - The Society accepts no responsibility for the use of information related to its Services which was not provided for the purpose by the Society or with its assistance.

6.2. - If the Services of the Society cause to the Client a damage which is proved to be the direct and reasonably foreseeable consequence of an error or omission of the Society, its liability towards the Client is limited to ten times the amount of fee paid for the Service having caused the damage, provided however that this limit shall be subject to a minimum of eight thousand (8,000) Euro, and to a maximum which is the greater of eight hundred thousand (800,000) Euro and one and a half times the above mentioned fee.

The Society bears no liability for indirect or consequential loss such as e.g. loss of revenue, loss of profit, loss of production, loss relative to other contracts and indemnities for termination of other agreements.

6.3. - All claims are to be presented to the Society in writing within three months of the date when the Services were supplied or (if later) the date when the events which are relied on of were first known to the Client, and any claim which is not so presented shall be deemed waived and absolutely barred. Time is to be interrupted thereafter with the same periodicity.

ARTICLE 7

7.1. - Requests for Services are to be in writing.

7.2. - **Either the Client or the Society can terminate as of right the requested Services after giving the other party thirty days' written notice, for convenience, and without prejudice to the provisions in Article 8 hereunder.**

7.3. - The class granted to the concerned Units and the previously issued certificates remain valid until the date of effect of the notice issued according to 7.2. here above subject to compliance with 2.3. here above and Article 8 hereunder.

7.4. - The contract for classification and/or certification of a Unit cannot be transferred neither assigned.

ARTICLE 8

8.1. - The Services of the Society, whether completed or not, involve, for the part carried out, the payment of fee upon receipt of the invoice and the reimbursement of the expenses incurred.

8.2. Overdue amounts are increased as of right by interest in accordance with the applicable legislation.

8.3. - The class of a Unit may be suspended in the event of non-payment of fee after a first unfruitful notification to pay.

ARTICLE 9

9.1. - The documents and data provided to or prepared by the Society for its Services, and the information available to the Society, are treated as confidential. However:

- clients have access to the data they have provided to the Society and, during the period of classification of the Unit for them, to the **classification file** consisting of survey reports and certificates which have been prepared at any time by the Society for the classification of the Unit;
- copy of the documents made available for the classification of the Unit and of available survey reports can be handed over to another Classification Society, where appropriate, in case of the Unit's transfer of class;
- the data relative to the evolution of the Register, to the class suspension and to the survey status of the Units, as well as general technical information related to hull and equipment damages, are passed on to IACS (International Association of Classification Societies) according to the association working rules;
- the certificates, documents and information relative to the Units classed with the Society may be reviewed during certificating bodies audits and are disclosed upon order of the concerned governmental or inter-governmental authorities or of a Court having jurisdiction.

The documents and data are subject to a file management plan.

ARTICLE 10

10.1. - Any delay or shortcoming in the performance of its Services by the Society arising from an event not reasonably foreseeable by or beyond the control of the Society shall be deemed not to be a breach of contract.

ARTICLE 11

11.1. - In case of diverging opinions during surveys between the Client and the Society's surveyor, the Society may designate another of its surveyors at the request of the Client.

11.2. - Disagreements of a technical nature between the Client and the Society can be submitted by the Society to the advice of its Marine Advisory Committee.

ARTICLE 12

12.1. - Disputes over the Services carried out by delegation of Governments are assessed within the framework of the applicable agreements with the States, international Conventions and national rules.

12.2. - Disputes arising out of the payment of the Society's invoices by the Client are submitted to the Court of Nanterre, France.

12.3. - **Other disputes over the present General Conditions or over the Services of the Society are exclusively submitted to arbitration, by three arbitrators, in London according to the Arbitration Act 1996 or any statutory modification or re-enactment thereof. The contract between the Society and the Client shall be governed by English law.**

ARTICLE 13

13.1. - **These General Conditions constitute the sole contractual obligations binding together the Society and the Client, to the exclusion of all other representation, statements, terms, conditions whether express or implied. They may be varied in writing by mutual agreement.**

13.2. - The invalidity of one or more stipulations of the present General Conditions does not affect the validity of the remaining provisions.

13.3. - The definitions herein take precedence over any definitions serving the same purpose which may appear in other documents issued by the Society.

GUIDANCE NOTE NI 601

NI 601

Tanker Plus - Inland Navigation Vessels

February 2013

Section 1 General Provisions

Section 2 Hull Structure

Section 3 Machinery, Systems and Electrical Installations

Appendix 1 Tanker Plus Record's Report Forms

SECTION 1 GENERAL PROVISIONS

1 General

1.1 Application

1.1.1 Quality label **Tanker Plus** is assigned to classed inland navigation tank vessels complying with the requirements of this Guidance Note. The vessel may be classed with Bureau Veritas or with another recognised classification society.

1.2 Scope

1.2.1 Quality label **Tanker Plus** is assigned to inland navigation tank vessels in order to reflect the following:

- condition assessment of hull structure has been carried out according to Sec 2, [1.2]
- condition assessment of machinery, systems and electrical installations has been carried out according to Sec 3, [1.2]
- documents allowing vessel condition monitoring has been reviewed.

1.2.2 The scope of such vessel condition assessments varies significantly, depending on the tanker's age and type.

1.2.3 **Tanker-Plus** for inland tankers:

- is a service which is provided as a supplement to class and is designed to be complementary. It is a consultancy service that documents the condition of a vessel at a specific period of time in the vessel's life and identifies the actual quality standard of the vessel in comparison to Class Rules.
- provides a comprehensive survey report in an easily accessible and understandable format, which includes observations, indexes and photographic records.
- sets quality index, between A - D (See Tab 1), that easily identifies the condition, reliability and maintenance standard associated with the vessel being assessed.
- is an added value product for vessel Owners who wish an independent assessment of their vessel's condition (benchmarking), or who wish a quality document which can be used to advertise their vessel(s) to prospective buyers, charterers, terminal receivers, underwriters or other parties
- may be used as proof of managing the best practice in vessel maintenance as well as managing record of the vessel's condition in case of navigation incidents or litigation
- may be used by vessel operators for benchmarking purposes as part of their self-assessment strategy.

Table 1 : Tanker-Plus indexes

Index	Description
A	Superior condition
B	Good condition
C	Acceptable condition
D	Poor condition

1.3 Surveys

1.3.1 Tanker-Plus is to be carried out concurrently with class renewal surveys. However, Tanker-Plus may be carried out independently of class renewal surveys subject to vessel survey afloat including visual inspections.

1.3.2 Prior to commencement of surveys, ultrasonic thickness measurement and insulation megger test reports are to be gathered for evaluation and comments. Validity of the reports gathered must not exceed 3 years from the date of assessment. Otherwise, ultrasonic thickness measurement in accordance to Sec 2, [5] and insulation megger test in accordance to Sec 3, [5] are to be carried out.

Should any findings below class minimum requirements be discovered and not be repaired, then the Surveyor shall formally advise the client using Tanker-Plus Executive Summary. It should be pointed out that the vessel's operator is required to inform the vessel's Class Society of such findings.

1.3.3 The Owner should provide at least the following documents to Society, where applicable. The documents gathered shall be reviewed and compiled in Tanker-Plus Record:

- class periodical survey reports at current term (Class renewal survey, Intermediate survey, etc.)
- occasional survey reports.

2 Tanker-Plus indexes

2.1 Index A - Superior condition

2.1.1 Examination and/or measurements carried out with the results showing either minimal or no deterioration from 'as new' condition. Superior maintenance condition exists. No preventive or corrective maintenance is required.

2.2 Index B - Good condition

2.2.1 Examination and/or measurements carried out with the results showing a level of deterioration from 'as new' condition. No preventive or corrective maintenance required.

2.3 Index C - Acceptable condition

2.3.1 Examination and/or measurements carried out with the results showing that the condition is acceptable according to class rules. No imminent corrective maintenance is required. Preventive maintenance may be required to halt deterioration.

2.4 Index D - Poor condition

2.4.1 Examination and/or measurements carried out with the results showing defects, deficiencies or condition below what is acceptable according to class rules. Imminent corrective maintenance is required.

3 Tanker-Plus procedures

3.1 Request

3.1.1 The request can be made directly through the client's local Bureau Veritas district office, or online at BV Inland Navigation Management's website: www.veristar.com > Services > Inland Navigation.

3.2 Planning preparation

3.2.1 On receipt of a request for Tanker-Plus, the local Bureau Veritas district office will contact the client to discuss the scope of Tanker-Plus in order to compile a cost efficient quotation.

3.2.2 On acceptance of quotation, the Bureau Veritas local office representative shall meet with the client's representative(s) to draft out the planning which sets out the scope and extent of Tanker-Plus surveys that are to be carried out.

3.2.3 The planning document is finalised onboard the vessel during meetings between the surveyor in charge and the client's representative.

3.3 Planning meeting

3.3.1 Tanker-Plus surveys begin with a planning meeting held onboard the vessel. This meeting is held to familiarise all the concerning parties with Bureau Veritas' Tanker-Plus assessments for the subject vessel.

3.3.2 Following points are to be discussed during the meeting:

a) Contents of the planning document
b) Scope of Tanker-Plus surveys
c) Inspection arrangements
d) Safety requirements
e) Other relevant issues.

3.3.3 Within the planning meeting, Owner representative and the BV Surveyor discuss the conditions under which the inspections and tests will be carried out. Special attention is to be paid by the Owner representative to identify the internal spaces, preparing the tanks for survey and safety procedure to be applied for the functional tests.

3.3.4 The Owner shall ensure that the spaces to be inspected are properly cleaned and safely accessible. It is also their responsibility to ensure that machinery and systems are ready to be tested. Provision is to be made to allow Surveyor to perform the planned close-up surveys and attend the thickness measurements, and the appropriate safety level is to be ensured and maintained at all times.

3.3.5 Recognised or approved service suppliers according to applicable Society's Rules to execute the testing and measurements, where applicable.

3.4 Attestation

3.4.1 The Tanker-Plus Attestation shall be issued after completion and validation of the Tanker-Plus Record.

3.4.2 Tanker-Plus Attestation issued by Bureau Veritas do not have validity. It is issued to certify that the vessel has a specific Tanker-Plus Index on a specific date.

3.5 Assessment of reparation

3.5.1 The survey consists of assessing the tanker's condition after the possible repairs has been caried out, if any.

3.5.2 On completion of the assessment, if need be, Surveyor provides the Owner with a list of defects or deficiencies to be upgraded to achieve at least the Index C as defined in [2.3]. Defect and deficiencies should be mentioned in Executive Summary and representative photographic evidence should be taken, if any. The Owner then decides to carry out the repair or not.

3.5.3 Repairs carried out during survey are also to be mentioned in Executive Summary and the indexes are upgraded accordingly.

4 Tanker-Plus Record

4.1 General

4.1.1 Prior to completion of Tanker-Plus assessment, the Owner should provide the following documents to the Society. The documents gathered shall be reviewed and compiled in Tanker-Plus Record:

- Approved structural drawings
- Class survey report at current term (Class renewal survey, Intermediate survey, etc.)
- Ultrasonic thickness measurement report
- Insulation megger test report

4.1.2 On the completion of the Tanker-Plus surveys, the Surveyor provides a report that details the verification of gathered documents, the extent of surveys carried out, the condition of the vessel at the time of survey, details of repairs and upgrades together with photographic records.

4.1.3 Where a structural condition assessment survey has been carried out and a critical area review has been undertaken, then monitoring areas should be mentioned in Tanker-Plus Record Executive Summary if any anomalies were found that would warrant monitoring. The monitoring areas shall include a list of items to be monitored, a proposed timeframe for monitoring and sketches/photographs, if applicable.

4.1.4 Tanker-Plus Record shall normally be issued within the period of one month to three months from the end of the survey and reviewed of gathered reports and documents. Tanker-Plus Record is provided with both paper and electronic copies according to the client's needs and requirements for reporting.

4.1.5 Tanker-Plus Record includes an Executive Summary which gives an overview of the surveys carried out including the verification of gathered documents, the surveys' findings and the Tanker-Plus Index awarded.

4.1.6 Tanker-Plus Record and documents gathered upon completion of Tanker-Plus assessment should be in English. In case where certificates or attestations submitted during Class survey are in another language, translation in English for the list of concerning certificates or attestations should be provided.

4.1.7 The format of the condition assessment report may vary depending on the scope of surveys and this format is normally agreed with the client prior to the commencement of the surveys. The following report layout is typical of Tanker-Plus Record:

a) Cover page (Identifying the type of report with the vessel's photo.) (See App 1, Fig 1)

b) Bureau Veritas general conditions

c) Tanker-Plus Record table of content

d) Vessel's general particulars (See App 1, Fig 2)

e) Tanker-Plus Record Attestations (See App 1, Fig 3)

f) Tanker-Plus Record Executive Summary (See App 1, Fig 4 to App 1, Fig 7)

g) Drawings
- General arrangement plan
- Approved structural drawings (e.g midship sections, etc)

h) Reports and Certificates gathered
- Class Survey Reports
- Ultrasonic Thickness Measurement Report
- Insulation Megger Test Report

i) Hull Structure Report (See App 1, Fig 8 to App 1, Fig 10)

j) Machinery, Systems and Electrical Installations Report (See App 1, Fig 11 to App 1, Fig 13)

4.2 Reporting for repair

4.2.1 General

Repairs carried out within the scope of Tanker-Plus survey are to be mentionned in Executive Summary as defined in [3.5]. Details of repair are to be commented to ensure the good conduct during reparation and clear reporting, if any. The information according to [4.2.2] to [4.2.5] is to be included in the reporting of reparation.

4.2.2 Qualification of personnel

Personnel dealing with welding and non destructive examination are to fulfill the following required qualifications:

a) Qualification of welders

Qualification of manual, semi-automatic and automatic welding operators are to be in accordance with NR217, Pt B, Ch 8, Sec 1 [1.4]. Certified welders must be of recognised national and international standard. Recognition of other standards is subject to submission to the Society for evaluation.

b) Qualification of NDE operators

Qualification of personnel performing non destructive examination for the purpose of assessing quality of welds in connection with repairs are to be in accordance with NR217, Pt B, Ch 8, Sec 1 [1.4].

4.2.3 Welding

Welding consumables and procedures adopted are to be in accordance with NR217, Pt B, Ch 8, Sec 1 [1.3]. Quality procedures are to be of recognised national and international standard. Recognition of other standards is subject to submission to the Surveyor for evaluation.

4.2.4 Materials

The requirements for materials used in repairs are in general the same as the requirements for material specified in NR217, Pt B, Ch 2, Sec 3 for construction.

Replacement material is in general to be of the same grade as the original approved material. Alternatively, material grades complying with the recognised national and international standards may be accepted by the Society provided that such standards are equivalent to the requirement of the original grade or are agreed with the Surveyor.

4.2.5 Repair quality standard

Repairs carried out are to comply with technical quality requirements according to recognised national and international standards or accepted by the Surveyor. Quality of repair is to be evaluated by the Surveyor.

Method and quality of repair are to be mentionned in the reporting.

4.3 Photographic records

4.3.1 General

During Tanker-Plus survey, Surveyor is to take representative photographs of the condition of hull structure, machinery, system and electrical installations to enable the client to gain an overview and insight into the visual state of the tanker being assessed.

These photographs are attached to the hull structure report and machinery, systems and electrical installations report in Tanker-Plus Record.

Photograph records may also be taken to show any other findings during survey:

- Defects identified
- Repairs, upgrade and reactification carried out
- Monitored areas where anomalies found that would warrant monitoring
- Modifications carried out
- Other findings that needs special inspection

The photographic evidence of the hereabove items are attached in Executive Summary.

4.3.2 Photographic device specifications

The following are the minimum specifications for photographic device during Tanker-Plus survey:

a) Type of camera 'Point-and-Shoot' or 'Compact'

b) Lens focal length, 35 mm equivalent of 50 mm

c) Lens aperture of f3.9

d) Image resolution of 10 mega pixels.

4.3.3 Photography method

The photographic record aims to project the visual state of the inspected elements with representative and clear photos at the time of Tanker-Plus survey.

At least, one photo per Section or Group is to be taken.

Date when the photo is taken must be displayed on the photograph.

Lens of photographic device should be cleaned before the photograph is taken. Lens may be configured to focal length of 50 mm to obtain the field of vision close to human eye.

Surveyor is to ensure the device is stable and there is sufficient light when the photograph is taken. Flash of photographic device is to be used judiciously and digital zoom is to be avoided.

Device should be properly positioned with appropriate distance and angle in order to have a clear view and to fulfill the purpose of the photographic record taken.

SECTION 2 HULL STRUCTURE

1 General

1.1 Concept of Tanker-Plus assessment for hull structure

1.1.1 Bureau Veritas' Tanker-Plus assessment for hull structure identifies and reports on the actual condition of the vessel's structure. The hull structure surveys consist on assessing the structural condition through an overall inspection, a close-up inspection and thickness measurement and non-destructive testing where relevant. The extent of surveys required to be carried out and the subsequent reporting requirements, are discussed and agreed with the client during planning meeting

1.2 Scope of Tanker-Plus assessment for hull structure

1.2.1 By definition according to NR217 (Rules for Inland Navigation Vessels), hull is the structural body of a vessel including all strength components, i.e. shell plating, walls, framing, decks, bulkheads, etc. of the main hull, superstructures and deckhouses. The hull also includes:

- all portions of the vessel extending beyond the main hull outline (appendages) such as rudder and rudder stock, shafting pipes, struts, bossing, bilge keels, bowsprit, anchors and anchor chain cables, etc.
- river chest
- structures permanently connected by weld to the vessel's such as guard rails, bitts, fixed parts of lifting appliances, machinery bedding, etc.
- tanks integrated to the hull structure
- independent cargo tanks.

1.2.2 The scope of surveys shall be equivalent to the scope of overall surveys, close-up surveys and ultrasonic thickness gauging as required for the current class renewal survey specified by the BV Inland Rules applicable at the time of the Tanker-Plus surveys.

1.2.3 Prior to completion of Tanker-Plus assessment at any age of the tanker, ultrasonic thickness measurement (UTM) report should be gathered according to [5.1.1]. In the case where valid UTM report is unavailable, thickness measurement assessment has to be carried out and the report has to be provided.

2 Vessel Section and Area(s) Under Consideration (AUC)

2.1 Definition

2.1.1 To facilitate the assessment, review and reporting of the vessel's structural condition, the vessel structure is broken into different "Sections" such as external hull, main deck, cargo tanks, cargo holds, ballast space, etc.

2.1.2 Each Section is then further subdivided into several "Sub-sections" or "Elements" which are small enough to be readily examined and evaluated by the surveyor, but not so small as to be structurally insignificant or too numerous to be practically reported on.

These Sub-sections are termed as Areas Under Consideration (AUC). The number of AUC's incorporated into a Vessel Section will usually be a minimum of six, however, it can be more depending on the layout of the Section or depending on the surveyor's review.

2.2 Vessel Section and AUC's average Index

2.2.1 During close-up and overall surveys, each AUC is individually assessed and given an index for visual structure condition, wastage structure and coating condition. All individual AUC's indexes are then combined to give a Structural Section Index for the specific vessel Section being surveyed and reported upon.

2.2.2 An Overall Structural Condition Index for the hull structure surveys is then computed by averaging the indexes attributed to the different surveyed Sections of the hull structure.

3 Visual structure condition

3.1 General

3.1.1 Visual structure condition of the AUC's are assessed during overall and close-up surveys and a Index from A to D is given to each AUC in each Section.

3.1.2 Surveys are undertaken to assess the condition of structure as regards damages, indents, buckling, cracks, tightness, grooving, pitting; crevice corrosion, erosion corrosion, bacterial corrosion, stress corrosion and other type of defects.

3.1.3 Representative photographic is to be taken while assessing visual structure condition. Photographic record is to be taken according to Sec 1, [4.3].

3.2 Visual structure condition index

3.2.1 In accordance with the index criteria given in Sec 1, [2], the indexes for visual structure condition are defined in Tab 1.

Table 1 : Visual structure condition index

Index	Description	Allowable margin for defects
A	Superior condition	0 to 25%
B	Good condition	25 to 75%
C	Acceptable condition	75 to 100%
D	Poor condition	More than 100%

4 Structure protective coatings condition

4.1 General

4.1.1 During the overall and close-up surveys, the vessel's structural protective coatings condition such as coating breakdown, cracking, flaking, blistering, detachment, etc. are surveyed and reported upon.

Within these surveys the condition of the coatings for the various AUC's are defined and indexes are then applied.

4.2 Protective coating condition index

4.2.1 The protective coating condition is assessed against the definitions of coating conditions "Good", "Fair" and "Poor" as defined in Tab 2.

Table 2 : Coating condition indexes criteria

Index	Coating Condition	Definition
A	Good	Condition with spot rusting on less than 3% of the area under consideration without visible failure of the coating. Rusting at edges or welds, must be on less than 20 % of edges or weld lines in the area under consideration.
B	Fair	Condition with breakdown of coating or rust penetration on less than 20 % of the area under consideration. Hard rust scale rust penetration must be less than 10 % of the area under consideration. Rusting at edges or welds must be on less than 50 % of edges or weld lines in the area under consideration.
C	Poor	Condition with breakdown of coating or rust penetration on more than 20% or hard rust scale on more than 10% of the area under consideration or local breakdown concentrated at edges or welds on more than 50 % of edges or weld lines in the area under consideration.
N/C	-	No protective coating fitted
N/A	-	Not applicable
Note 1: Soft Coatings or Semi Hard Coatings are not rated in the scope of this document, however where these are found to have been fitted then these are to be identified within the Structural Condition in Executive Summary. **Note 2:** Spot rusting is rusting in spots without visible failure of coating. **Note 3:** Blistering is bubble formation scattered on the surface of a paint film, with diameter ranging from 3 - 4 mm to 20 - 30 mm.		

5 Wastage of structure - Ultrasonic Thickness Measurements (UTM)

5.1 General

5.1.1 Prior to completion of Tanker-Plus Record, Ultrasonic Thickness Measurement (UTM) report has to be provided for review of the reporting and evaluation of structural wastage is to be carried out. The validity of UTM report gathered must not exceed 3 years from the date of assessment. In the case where valid UTM report is unavailable, thickness measurement assessment has to be carried out and the report is to be compiled in the Tanker-Plus Record for review and evaluation.

5.1.2 Wastage of structures are assessed during overall and close-up surveys based on Ultrasonic Thickness Measurements and the structure's percentage of diminution. The UTM assessment is to be carried out in accordance with BV Rules NR597 - Requirements for Thickness Measurements Applicable to Inland Navigation Vessels.

5.1.3 In a similar fashion to the methodology for visual structure condition and protective coating condition, individual Index are awarded for wastage of structure for each AUC within the survey. These indexes are then combined with individual indexes for Visual Structure and Protective Coating to give an Average Index Value for each AUC, which is then computed to give a final Index for the specific Section being surveyed.

Note 1: Due to various circumstances such as inaccurate measurement, stray pits, etc., then there will be some deviations in UTM readings which means that some flexibility in assessment is required. Therefore, an allowance of 10% of errant readings may be allowed as long as these are randomly scattered and no repairs are deemed necessary by the Surveyor.

5.2 Wastage of structure index

5.2.1 Wastage of structure indexes are assigned by reviewing the UTM readings against permissible diminution of structure, as defined in Tab 3.

Table 3 : Wastage of structure indexes criteria

Index	Description	% of permissible diminution
A	Superior condition	0 to 25%
B	Good condition	25 to 75%
C	Acceptable condition	75 to 100%
D	Poor condition	More than 100%

5.3 Areas of substantial corrosion

5.3.1 Substantial corrosion is an extent of corrosion such that the assessment of the corrosion pattern indicates a wastage in excess of 75% of allowable margins, but within acceptable limits. i.e. an index C.

5.3.2 If any AUC of the Section shows an Index C, then the Overall Structural Condition Index of Tanker-Plus awarded for the vessel cannot be higher than Index B.

5.3.3 Areas of substantial corrosion shall be included in the surveyors' proposals to the client for regular inspection and monitoring. These Monitoring Areas should be mentioned in the Tanker-Plus Record, Executive Summary.

6 Index calculation methodology for hull structure

6.1 General

6.1.1 The Bureau Veritas index system for condition assessment is broadly defined within Sec 1, [2].

6.1.2 To arrive at an overall index for the vessel structure, the following elements pertaining to structure, structural strength and maintenance of structure are indexed individually and collectively:

a) Visual inspection condition

b) Protective coatings condition

c) Wastage of structure.

Individual indexes are awarded for each of the above elements. These individual indexes are combined to compute the average of Structural Section Index and then finally an Overall Structural Condition Index for the vessel structure condition is awarded.

6.1.3 For the calculation of each vessel Section and AUC, Tanker-Plus Indexes are converted to numerical values as defined in Tab 4.

Table 4 : Index value for calculation methodology

Index	Description	Index Value
A	Superior condition	1
B	Good condition	2
C	Acceptable condition	3
D	Poor condition	4

6.2 Index calculation process

6.2.1 During Tanker-Plus surveys, individual Indexes are awarded for Visual Structure Condition, Protective Coatings Condition and Wastage of Structure for each AUC surveyed. These Indexes are then combined and converted to give an Average Index Value, rounded to the nearest first decimal point for each AUC.

6.2.2 Each AUC's Average Index Value is then tabulated and combined to give an Average Section Index Value which is then rounded to the nearest whole number to give a final individual Index for the specific Section being surveyed.

6.2.3 To arrive at an Overall Structural Condition Index, the Average Structure Indexes awarded for each Section are combined and an Average Structure Index Value are computed and rounded to the nearest first decimal.

6.2.4 The following descriptions and illustrations explain how the index for Section Index and Overall Structural Condition Index are computed:

a) Index value rounded to the nearest integer:

An average Index value is calculated and rounded to the first integer.

Where the digit ranges from 0 to 4, the Index Value is rounded to the lower value (or better Index). Otherwise, the Index Value is rounded to the upper value (or worse Index).

The description is further explained in the following example of Fig 1.

Figure 1 : Illustration of index value rounded to the nearest integer

No.	Vessel Sections	Visual Structure	Visual Coatings	Measured Wastage	Average Index Value
1	**Section:** Cargo Tank 1				
	Deck plating	A	A	A	1
	Inner bottom plating	A	B	A	1.3
	Inner side plating	A	B	A	1.3
	Longitudinal centre bulkhead	A	A	A	1
	Transverse bulkhead forward	A	A	A	1
	Transverse bulkhead aft	B	B	A	1.7
	Average Section Index Value				1.2
	Section Index				**A**
	Revised Section Index				N/A

b) Revision of Index:

An average Index cannot be better than one Index grade better than the worse Index awarded.

Therefore, the Index is revised upwards.

The description is further explained in the following example of Fig 2.

Figure 2 : Illustration of revision of index

No.	Vessel Sections	Visual Structure	Visual Coatings	Measured Wastage	Average Index Value
1	**Section:** Cargo Tank 1				
	Deck plating	A	A	A	1
	Inner bottom plating	A	B	A	1.3
	Inner side plating	A	B	A	1.3
	Longitudinal centre bulkhead	A	A	A	1
	Transverse bulkhead forward	A	A	A	1
	Transverse bulkhead aft	B	C	A	2
	Average Section Index Value				1.3
	Section Index				**A**
	Revised Section Index				B

7 Hull Structure Reporting

7.1 General

7.1.1 On the completion of the Tanker-Plus survey, the Surveyor compiles a report for each Section and AUC being assessed. It includes:

a) Table for Tanker-Plus Index awarded for Hull Structure, the for compilation of the Index awarded for Overall Structural Condition and a set of individual Section reports, complete with photographic records of the surveys.

Specifications and methodology for photographic records are described in Sec 1, [4.3].

b) Details of areas to be monitored and areas with substantial corrosion are to be mentioned in Executive Summary.

SECTION 3 MACHINERY, SYSTEMS AND ELECTRICAL INSTALLATIONS

1 General

1.1 Concept of Tanker-Plus assessment for machinery, systems and electrical installations

1.1.1 Bureau Veritas' Tanker-Plus assessment for machinery, system and electrical installations is a risk-management tool designed to assess the actual operational condition of the hull machinery, propulsion and auxiliary machinery, fittings and systems. This provides the vessel owner/manager with a more robust assessment of their onboard assets that could be deduced by onboard testing and gives added values by providing a thorough record of condition.

1.2 Scope of Tanker-Plus assessment for machinery, systems and electrical installations

1.2.1 Tanker-Plus surveys for machinery, systems and electrical installations assessment entails of the following scope of item:

- Hull and deck equipment and fittings
- Propulsion and auxiliary machinery, fittings and systems

1.2.2 The assessment is carried out for each item through a visual inspection, a function test and a insulation test where applicable. Equipment and systems will be inspected having regard to the general condition, leakages, supporting devices, instrumentation, emergency arrangements.

1.2.3 In general, the Surveyor will not request the opening up of equipment for inspection but may request that a unit be disassembled for inspection in the case where the item shows signs of deterioration in external condition or during function testing. The operation and maintenance program declared by the clients should be in conformity with the guidance provided by the equipment manufacturers. Previous records for systems and machinery under assessment are consulted in order to identify recurrent problems.

2 Hull machinery groups and Item(s) Under Consideration (IUC)

2.1 Definition

2.1.1 Using the methodology as hull structure, review and reporting of the operational condition of the machinery, systems and electrical installations are broken into different "Groups" as listed in Tab 1.

2.1.2 Each "Group" is then further subdivided into several "Elements" which are small enough to be readily examined and evaluated by the Surveyor, but not so small as to be structurally insignificant or too numerous to be practically reported on.

These "Elements" are termed as Items Under Consideration (IUC). Hull machinery Groups and IUC's are very dependent on the type of vessel which is being assessed, so the examples of "Groups" and IUC's given are not to be taken as comprehensive or exhaustive but may be provided for illustration purposes.

Table 1 : List of hull machinery groups

Hull Machinery Groups		Items
01	Anchoring and Mooring Installation and Equipment	Windlasses, gypsies and anchor chain stoppers, anchors and shackles, anchor chains, shackles and bitter end securing arrangement, mooring and winches, mooring wires and ropes, rope tails and shackles, fire wires, emergency towing equipment and bow stoppers, chocks, pedestal rollers, bollards and capstans, winch brake test equipment, etc.

Hull Machinery Groups		Items
02	Steering Gear and Rudder(s)	Steering gear, foundations and holding bolts, hydraulic pumps and telemotors, angle indicators, communications with bridge, auxiliary steering arrangement, steering gear room and drip trays, steering gear lubrication devices, oil drop tanks and other replenishing arrangements, auto start/stop function of steering power and control units, rudder locking device/hydraulic pump, rudder(s) structure, rudder bearings condition and clearances, leakage test, etc.
03	Hull and Cargo Machinery	Cranes, derricks, cargo pumps, stripping pumps, ballast pumps, bow thrusters, tank cleaning machines and attachments, machinery room ventilation systems, hydraulic pumps and tanks, bunker transfer pumps, inert gas generators and fans, deck air compressors, cargo compressors, re-liquefaction equipment, refrigeration equipment and pumps, etc.
04	Hull Electrical Equipment and Cabling	Lighting systems, electrical cabling, cable sealing, cable runs and junction boxes, Intrinsically safe electronics, electrical and electronic equipment start/stop and control systems, solenoids and valve/damper/door position indicators, motors, deck generators, air horns/typhoons, alarm indicators, transformers, switchboards, starter panels, electrical bonding for pipes and couplings, etc.
05	Hull and Cargo Fittings	Deck tanks, PV breakers, deck seals, tank level systems, hold or void space water detection equipment, tank cleaning heaters, cargo heaters, cargo hoses, butterworth hoses, gas devourers, gas freeing equipment, container mountings and sockets, deck and cargo hold fittings, chains, etc.
06	Closing Appliances	Hatch covers including hatch coamings, tank/hold/void space access and covers, cargo ventilation ducts and trunks, watertight doors and access hatches to accommodation, machinery rooms and store rooms, air pipes and vent heads, fire dampers and hatches for accommodation, machinery rooms and store rooms, PV valves, PV breakers, vapour locks, etc.
07	Hull Piping and Valves	Pipelines for cargo, ballast and tank cleaning, stripping, hydraulic, steam, fuel transfer, bilge, inert gas, vapour return, cargo heating coils, water spray systems and deck showers, including pipe supports and clamps, on deck, tanks, holds and machinery rooms, valves and relief valves, strainers and mud boxes, bilge and ballast eductors, cargo eductors, etc.
08	River Connections and Valves	River valves, overboard discharge valves and cocks, testing arrangements of river valves where fitted, river pipe attachments to the hull, including within engine and machinery spaces, etc.
09	Hull Miscellaneous	Accommodation ladders, gangways, ladders and walkways on deck, hatches and on forecastle, foremast, light posts, kingposts, bulwarks and railings, deck and machinery houses and store rooms, bulkhead seals (e.g. between pump or compressor room and motor or engine room), spare propeller and mounting, general tools, chain blocks and associated lifting equipment etc.
10	Fire/Smoke/Gas Detection and Fire Fighting Systems	Pipelines, hoses, monitors, nozzles, applicators, valves and spanners for fire, foam, CO_2 and dry powder fire fighting systems on deck, tank, hold, machinery and store rooms, semi portable and portable fire fighting extinguishers, fire and smoke detection systems and alarms, portable gas detection equipment and oxygen meters, fixed gas detection systems for pump rooms, ballast tanks, etc., fire fighting suits, breathing apparatus and compressors, smoke hoods, etc.
11	Engine Room, Auxiliary Machinery Spaces and Engine Store Rooms	Cleanliness of engine & machinery spaces and store rooms, condition of coatings, condition of floor plates, platforms and stairways, condition of bilges, condition of railings and hand rails condition of devices to protect crew against falls and dangers due to moving parts, hot surfaces and other hazards, condition of spare parts in storage etc.
12	Main Propulsion Installations	Diesel engines, crankcases, casing doors, safety devices and valves, safety systems including alarms and trips, flexible couplings, attached pumps, attached fixed & flexible piping and bellows pieces, bedplates, holding down and tie bolts, HP fuel pumps, turbo blowers and associated coolers, insulation, manoeuvring gears, clutches, turning gears, reduction gear(s), coupling bolts, main, thrust and steady bearings, intermediate shafts and bearings, torsion meter assemblies, instruments and gauges, safety valves, cooling and lubrication systems etc,
13	Tailshaft, Stern tube and Propeller Systems	Fixed and variable pitch propeller(s), tailshaft(s), stern tube bearings, sealing devices, and their associated lube oil systems, hydraulic systems instruments and gauges, safety valves and cooling systems
14	Auxiliary Engines	Diesel engines, cargo and ballast pump diesel engines and their associated casings, crankcases, safety devices and valves, safety systems including alarms and trips, vibration dampers, attached pumps, attached fixed & flexible piping and bellows pieces, bedplates, holding down bolts, fuel pumps, turbo blowers and associated coolers, insulation, reduction gear(s), coupling bolts, thrust and steady bearings, instruments and gauges, safety valves cooling systems etc,.

Hull Machinery Groups		Items
15	Oil Pumps and Purifiers	Fuel oil service pumps, bunker transfer pumps, diesel oil service pumps, lube oil service and transfer pumps, fuel oil separator and clarifiers, diesel oil purifiers and their attached, valves, instruments and gauges, safety valves, filters, strainers and bedplates etc,.
16	Fresh and River Water Pumps	Jacket cooling water pumps, feed water pumps, condensate pumps, centralised fresh water cooling systems circulating pumps, main and auxiliary circulating pumps, cargo condenser cooling pumps, scrubber pumps, deck seal pumps, river water service pumps, fire pumps, general service pumps, hydrophore pumps, hot water circulating pumps, air conditioning circulating FW pumps, and their attached, valves, instruments and gauges, safety valves, filters and strainers and bedplates, etc,
17	Compressors	Start air and emergency start air compressors, general service air compressors, control and instrument air compressors, air conditioning compressors, and their attached, valves, safety valves, instruments and gauges, safety valves and bedplates, etc.
18	Ventilation Fans	Forced draft fans, engine room exhaust air fans, engine room supply air fans, engine control room and workshop supply, exhaust and air conditioning units and fans, and their attached dampers, casings, etc.
19	Piping and valves	Fuel oil piping and valves, lube oil, hydraulic, compressed air, steam, river water, fresh water, bilge, ballast, feed water, gas burning supply, river chest vents, sewage and dirty water systems and mud boxes piping and valve systems, fixing clamps, vents, etc.
20	Boilers, Economisers and Thermal Oil Heaters	High pressure boilers, low pressure boilers, economisers, exhaust gas economisers, low pressure steam generators, thermal oil heaters, and their attached furnaces, casings, exhaust gas uptakes, man-holes and doors, hand-holes and doors, mountings, cocks, piping and valves and cocks, level gauges, instruments and gauges, safety valves and bedplates etc.
21	Heat Exchangers (others)	Evaporators, Jacket water coolers, Lube oil coolers, lube oil heaters (for purifiers), fuel oil heaters, main condensers, cargo condensers, gas or steam air pre heaters, de-aerators, hot wells, hot water calorifiers, and their attached, valves, instruments and gauges, safety valves and bedplates, etc.
22	Miscellaneous Equipment	Air receivers and reservoirs, hyrophore bottles, air ejectors, vacuum pumps, chemical injection pumps, emulsifiers, deionization plants, and their attached valves, instruments and gauges, safety valves and bedplates, etc.
23	Communication, Order Transmission and Remote Control / Emergency Stop Systems	Communication and order transmission system between the navigation bridge and the machinery control positions, between the bridge and the alternative steering position, remote control system of the main engine(s), control system of adjustable pitch propeller(s), emergency stops for pumps, ventilators and sea valves, quick release valves and their attached, piping and valves, instrumentation and gauges, and supports, etc.
24	Generators and Switchboards	Alternators, main motor generators, auxiliary generators, shaft generators, lighting generators, main switchboards, emergency switchboards, distribution switchboards and their attached Instrumentation, controls systems, couplings, supports, bedplates, cabling, etc.
25	Motors and Associated Starters	Drive motors and starters for oil pumps, purifiers, river and fresh water pumps, compressors, rotary air pre-heaters, ventilation fans, fuel pumps, air conditioning, ballast pumps, cargo pumps: etc. and their attached instrumentation, controls systems, couplings, supports, bedplates, cabling, etc.
26	Electrical installations (others)	Lighting, emergency lighting, light switches, transformers, electrical cables, cable runs, cable seals, junction boxes, etc.
27	Automated installation	Main engine control systems, auxiliary control systems, monitoring, alarm and automatic shut-off systems, automatic start up and change over of generators, automatic start up of standby units, bilge alarms. boiler safety systems, automatic combustion control systems, engineers and UMS alarms systems, etc.
28	Fire / Smoke / Gas Detection and Fire Fighting Systems	Fire pipelines, hoses, monitors, nozzles, applicators, valves and spanners for water, foam, CO2 and dry powder fire fighting systems in the machinery spaces and store rooms, semi portable and portable fire fighting extinguishers, fire and smoke detection systems and alarms, gas detection equipment and oxygen meters, fire fighting suits, breathing apparatus, smoke hoods, fire doors, watertight doors, emergency escapes, emergency escape signs, etc.
29	Environmental Management	Incinerators, sludge pumps, bilge pumps, oily water separators, sewage tanks, and their attached valves, instruments and gauges, safety valves and bedplates, etc.

2.2 Hull machinery groups and IUC's average index

2.2.1 Each IUC is individually assessed and given an index for visual inspection, function test and insulation test. All individual IUC's indexes are then combined to give a Operational Group Index for the specific Group being surveyed and reported upon.

2.2.2 An Overall Operational Condition Index for the machinery and electrical installations surveys is then computed by averaging the indexes attributed to the different Groups being surveyed.

3 Visual inspection

3.1 General

3.1.1 Visual inspections are carried out to assess the overall condition of each unit together with its appurtenances, bedplates and supports.

3.1.2 The Surveyor inspects (depending on the type of unit) for evidence of damage, deformation, cracks, leakages, coatings breakdown, corrosion, pitting, erosion, etc.

3.1.3 During these inspections the Surveyor takes representative photographs which are attached to the machinery, systems and electrical installations to provide a photographic record of the general condition of the IUC's. Photographic record is to be taken according to Sec 1, [4.3].

3.2 Visual Inspection Index

3.2.1 The visual inspection index criteria of each Item is defined in Tab 2.

Table 2 : Visual inspection index criteria

Index	Criteria
A	- Items and systems visually examined and/or measurements carried out with the results showing either minimal or no deterioration from 'as new' condition. - No deficiencies affecting safe operation exist. - Measurements are within 0-25% of allowable tolerances and/or recommendations. - Structure and supports show superficial reductions from 'as new' scantlings. - Good maintenance condition exists. - No system leakages exist. - No preventive or corrective maintenance is required.
B	- Items and systems visually examined and/or measurements carried out with the results showing a level of deterioration from 'as new' condition. - No deficiencies affecting safe operation exist. - Measurements are within 25-75% of allowable tolerances and/or recommendations. - Structure and supports show a level of deterioration from 'as new' scantlings. - Fair maintenance condition exists. - No system leakages exist. - No preventive or corrective maintenance is required.
C	- Items and systems visually examined and/or measurements carried out with the results showing deterioration from 'as new' condition but within that acceptable condition according to BV Rules for Inland Vessels. - No deficiencies affecting safe operation exist. - Measurements are within 75-100% of allowable tolerances and/or recommendations. - Structure and supports show reduction from 'as new' scantlings. - Poor maintenance condition exists. - No system leakages exist. - No imminent corrective maintenance is required. - Preventive maintenance may be required to halt deterioration.
D	- Items and systems visually examined and/or measurements carried out with the results showing significant deterioration from 'as new' condition below acceptable condition according to BV Rules for Inland Vessels. - Deficiencies affecting safe operation exist. - Measurements exceed tolerances and/or recommendations. - Structure and supports show significant reduction from 'as new' scantlings. - System leakages exist. - Corrective maintenance is required.

4 Function test

4.1 General

4.1.1 Function tests are carried out on equipment under operating conditions with the results assessed against the manufacturers' operational criteria, e.g. pumps and compressors have to have a test run and their performance has to be assessed, closing appliances are to be tested for full range of movement, machinery safety devices are to be tested and proved, alarms and instrumentation are to be actuated and inspected, pipelines are to be pressure tested, etc.

4.1.2 All hull and deck equipment, machinery and fittings are required to undergo function test. It is recognised that some vessel's systems will not be able to have their performance fully tested, however, these can be assessed by supplemental means such as simulation, level testing and chemical analysis.

4.2 Function test index

4.2.1 Function test are assessed prior to Index criteria in Tab 3.

Table 3 : Function test index criteria

Index	Criteria
A	- Items and systems and where applicable, their attached valves, operating devices and equipment, locking devices, fittings, instrumentation etc., are function tested with the results reaching rated values and/or full operation with either minimal or no deterioration from 'as new' condition. - Power output or power generation is able to maintain 96 - 100% of the designed value for sustainable/continuous rating. - Operating temperatures well within tolerances. - Attached safety devices, alarms, trips etc,. are function tested and proved 100% operational. - Piping systems reach required test pressure without leakages or pressure drop-off. - No preventive or corrective maintenance is required.
B	- Items and systems and where applicable, their attached valves, operating devices and equipment, locking devices, fittings, instrumentation etc., are function tested with the results showing a level of deterioration in rated values and/or full operation from 'as new' condition without affecting safe operation. - Power output or power generation is able to maintain 90 - 95% of the designed value for sustainable/continuous Index. - Operating temperatures are within tolerances. - Attached safety devices, alarms, trips etc., are function tested and proved 100% operational. - Piping systems reach required test pressure without leakages or pressure drop-off. - No preventive or corrective maintenance is required.
C	- Items and systems and where applicable, their attached valves, operating devices and equipment, locking devices, fittings, instrumentation etc., are function tested with the results showing deterioration in rated values and/or full operation from 'as new' condition but within acceptable condition according to maker's, BV Inland Class Rules requirements without affecting safe operation. - Power output or power generation is able to maintain 85-89% of the designed value for sustainable/continuous rating. - Operating temperatures are within tolerance but approaching the limits of tolerances or near to alarm condition. - Attached safety devices, alarms, trips etc., are function tested and proved 100% operational. - Piping systems reach required test pressure without leakages or pressure drop-off. - Preventive maintenance may be required to halt deterioration.
D	- Items and systems and where applicable, their attached valves, operating devices and equipment, locking devices, fittings, instrumentation etc., are function tested with the results showing significant deterioration from 'as new' condition below that acceptable condition according to maker's, BV Inland class Rules requirements. - Found with deficiencies which affect safe operation. - Power output or power generation is not able to maintain at least 85% of the designed value for sustainable/continuous Index. - Operating temperatures exceed tolerances or are in alarm condition. - Attached safety devices, alarms, trips etc., are function tested and are showing defects or deficiencies. - Piping systems do not reach required test pressure and/or leakages or pressure drop-off exists. - Corrective maintenance is required.

5 Insulation test

5.1 General

5.1.1 Prior to completion of Tanker-Plus Record, insulation megger testing report has to be provided for review of the reporting and evaluation of insulation test reading is to be carried out. The validity of insulation test report must not exceed 3 years. In the case where valid insulation test report is unavailable, insulation test assessment has to be carried out and the report is to be compiled in the Tanker-Plus Record for review and evaluation.

5.1.2 Insulation megger testing is to be carried out in accordance with Class requirements and the Index criteria should be applied.

Note 1: The overall Index assigned for an IUC cannot be higher than the Megger test Index if an Index D is assigned for the Megger results.

5.2 Insulation megger testing index

5.2.1 Insulation megger test index applied as defined in Tab 4.

Table 4 : Insulation megger testing indexes criteria

Index	Criteria
A	Over 100 Meg ohms.
B	20-100 Meg ohms.
C	Below 20 Meg ohms but above class minimum requirements.
D	Below class minimum requirements. Corrective action is required.

6 Index calculation methodology for machinery, systems and electrical installations

6.1 General

6.1.1 The Tanker-Plus index system for condition assessment is broadly defined within Sec 1, [2].

6.1.2 During machinery, systems and electrical installations survey, each IUC is indexed according to the following assessment to arrive to an average operational condition index:

a) Visual inspection condition

b) Function test

c) Insulation megger testing

Individual indexes are awarded for each of the above elements. These individual indexes are combined to compute the average operational Group index and then finally a Tanker-Plus index for the overall operational condition Index is awarded.

6.1.3 For the calculation of each Group and IUC's, Tanker-Plus indexes are converted to numerical values as defined in Tab 5:

Table 5 : Index value for calculation methodology

Index	Description	Index value
A	Superior Condition	1
B	Good Condition	2
C	Acceptable Condition	3
D	Poor Condition	4

6.2 Index calculation process

6.2.1 During Tanker-Plus surveys, individual Indexes are awarded for Visual Inspection, Function Test and Insulation Test for each Item surveyed. These Indexes are then combined to give an Average Index Value, rounded to the nearest first decimal point for each Item.

6.2.2 Each Item average index is then tabulated and combined to give an Average Group Index Value, which is then rounded to the nearest whole number to give a final individual index for the specific Group being surveyed.

6.2.3 To arrive at an Overall Operational Condition Index, the Operational Group Index awarded for all Groups are combined and an Average Operation Index Value are computed and rounded to the nearest first decimal.

6.2.4 The following description explains how the index for Operational Group Index and Overall Operational Condition Index are computed:

a) Index value rounded to the nearest integer:

An average Index value is calculated and rounded to the first integer.

Where the digit ranges from 0 to 4, the Index Value is rounded to the lower value (or better Index). Otherwise, the Index value is rounded to the upper value (or worse Index).

The description is further explained in the following example of Fig 1.

Figure 1 : Illustration of index value rounded to the first integer

No.	Hull Machinery Groups	Visual Condition	Function Test	Insulation Test	Average Index Value
1	**Group** Hull and Cargo Machinery				
	Cargo pump 1	A	A	A	1
	Cargo pump 2	B	A	A	1.3
	Balast pump 1	A	A	A	1
	Balast pump 2	B	B	B	2
	Forward fuel Oil transfer pump	A	B	B	1.7
	Pump room ventilation system fans	A	A	A	1
	Stores cranes	A	A	A	1
	Inert gas fan	B	B	B	2
	Inert gas generator	A	A	A	1
	Average Group Index Value				1.3
	Operational Group Index				**A**
	Revised Operational Group Index				N/A

b) Revision of Index:

An average Index cannot be better than one Index grade better than the worse Index awarded.

Therefore, the Index is revised upwards.

The description is further explained in the following example of Fig 2.

Figure 2 : Illustration of revision of index

No.	Hull Machinery Groups	Visual Condition	Function Test	Insulation Test	Average Index Value
1	**Group** Hull and Cargo Machinery				
	Cargo pump 1	A	A	A	1
	Cargo pump 2	A	C	A	1.7
	Balast pump 1	A	A	A	1
	Balast pump 2	A	B	A	1.3
	Forward fuel Oil transfer pump	A	B	A	1.3
	Pump room ventilation system fans	A	A	A	1
	Stores cranes	A	A	A	1
	Inert gas fan	A	B	A	1.3
	Inert gas generator	A	A	A	1
	Average Group Index Value				1.2
	Operational Group Index				**A**
	Revised Operational Group Index				B

7 Machinery, Systems and Electrical Installations Reporting

7.1 General

7.1.1 On the completion of the Tanker-Plus survey, the Surveyor compiles a report for each Group and IUC being assessed. It includes:

a) Table for Tanker-Plus Index awarded for Machinery, Systems and Electrical Installations, the for compilation of the Index awarded for Overall Operational Condition and a set of individual Group reports, complete with photographic records of the surveys.

Methods and specifications for photographic records are described in Sec 1, [4.3].

b) Details of areas to be monitored, any remarks and findings are to be mentioned in Executive Summary.

APPENDIX 1 TANKER PLUS RECORD'S REPORT FORMS

1 General

1.1

1.1.1 The present Appendix show typical report layout for Tanker-Plus Record. Tab 1 summarizes all the report forms:

Table 1 : Summary of Tanker Plus report forms

Report Form	Figure	Page
Cover page	1	24
General Particulars	2	25
Attestation	3	26
Executive Summary	4, 5, 6, 7	27
Hull Structure Report	8, 9, 10	31
Machinery, Systems and Electrical Installations Report	11, 12, 13	34

Figure 1 : Cover page (Identifying the type of report with the vessel's photo.)

INLAND NAVIGATION TANKER

VESSEL NAME

DNI/TANKER-PLUS/YEAR/NO

Minimum photo dimension 13 cm * 10 cm.
Vessel's photo with name appears in it.

BUREAU VERITAS
DNI

TANKER-PLUS

RECORD

Place and Country of Assessment

Period of Assessment

Figure 2 : Vessel's general particulars

Bureau Veritas
Inland Navigation Management

TANKER - PLUS Record
General Particulars

Vessel name:
BV Register no.:
Tanker-Plus reference:
Type and service notations:
Flag:
Date of build:
Port of registry:

Length overall:
Rule length:
Deadweight:
Breadth:
Depth:
Draft:
No. of tanks:

Vessel manager:
Adresse:
Technical manager:
Tel no.:
Fax no.:
Email:

Registered owner:
Connecting district:
Marine center:

Class status: *Date of the latest survey within the current term*
SSH/SSM, DOK, INH/INM, ANH/ANM, OSH/OSM

Tanker-Plus dates of survey:
Tanker-Plus place of survey:
Surveyors:
SSOM:

Bureau Veritas Representative	Place and Date	BV Stamp
Name:		
Signature:		

Figure 3 : Tanker-Plus Record Attestations

Bureau Veritas — **TANKER - PLUS Record**

Inland Navigation Management — **Attestation**

Vessel Name	Vessel Type	Date of Build
Class Society	**Register No.**	**Tanker-Plus Record Ref.**

Name and Address of Vessel Owners or Managers

Bureau Veritas carried out Tanker-Plus surveys in accordance with the BV Guidance Note NI 601 and vessel applicable annexes at the following place(s) and during the dates:

Situation _____ Location _____ Period of time From _____ to _____

Based upon the analysis of the results of the various surveys carried out it has been considered that on the _____ the following Tanker-Plus Indexes are assigned:

Final Index of Tanker-Plus Assessment	
Overall Index for Hull Structure	
Overall Index for Machinery, Systems and Electrical Installations	

This attestation is issued within the scope of Bureau Veritas Marine Divison General Conditions, attached overleaf, which form an integral part of this attestation which is issued in good faith and without prejudice, subject to the vessel systems which could not be assessed during the condition assessment surveys.

Bureau Veritas Representative	Place and Date	BV Stamp
Name:		
Signature:		

The latest published rules of Bureau Veritas Marine Division and the General Conditions therein are applicable.
Any person not a party to the contract pursuant to which this attestation is delivered may not assert a claim against Bureau Veritas for any liability arising out of errors or omissions which may be contained in the said attestation, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in the establishment or issuance of this attestation, and in connection with any activities that it may provide.

Figure 4 : Tanker-Plus Record Executive Summary - 1

Bureau Veritas — **TANKER - PLUS Record**

Inland Navigation Management — **Executive Summary**

Vessel Name	Vessel Type	Date of Build
Class Society	**Register No.**	**Tanker-Plus Record Ref.**
Name and Address of Vessel Owners or Managers as stated on the Request for Tanker-Plus Document		

This Executive Summary contains a synopsis of the Tanker-Plus assessment carried out onboard the subject vessel during _____
Reference is made to Bureau Veritas Document NI 601 DNI R00 E and to Class Rules NR 217 that were in force at the time of the Tanker-Plus Surveys.

The following are the content of the Executive Summary according to Tanker-Plus assessment carried out:

Documents gathered upon completion of Tanker-Plus assessment

- Approved drawing plans ☐
- Class survey report current term ☐
- Ultrasonic thickness measurement report ☐
- Insulation megger test report ☐
- (Other please enter detail here) ☐
- (Other please enter detail here) ☐

Hull Structure assessment

- Structural condition ☐
- Defects and/or Repairs ☐
- Modifications ☐
- Monitoring areas ☐
- (Other please enter detail here) ☐
- (Other please enter detail here) ☐

Machinery, Systems and Electrical Installations assessment

- Operational Condition ☐
- Defects and/or Repairs ☐
- Modifications ☐
- Monitoring areas ☐
- (Other please enter detail here) ☐
- (Other please enter detail here) ☐

Bureau Veritas Representative	Place and Date	BV Stamp
Name:		
Signature:		

Figure 5 : Tanker-Plus Record Executive Summary - 2

Bureau Veritas — **TANKER - PLUS Record**

Inland Navigation Management — **Executive Summary**

Vessel Name	Class Society	Tanker-Plus Record Ref.

Page ____ of ____

Comments on Documents Gathered

Figure 6 : Tanker-Plus Record Executive Summary - 3

Bureau Veritas

Inland Navigation Management

TANKER - PLUS Record

Executive Summary

Vessel Name	Class Society	Tanker-Plus Record Ref.

Page ____ of ____

Comments on Hull Structure

TANKER-PLUS INDEX AWARDED FOR HULL STRUCTURE	

DRAFT February 2013

Figure 7 : Tanker-Plus Record Executive Summary - 4

Bureau Veritas — **TANKER - PLUS Record**

Inland Navigation Management — **Executive Summary**

Vessel Name	Class Society	Tanker-Plus Record Ref.

Page ____ of ____

Comments on Machinery, Systems and Electrical Installations

TANKER-PLUS INDEX AWARDED FOR MACHINERY, SYSTEMS AND ELECTRICAL INSTALLATION	

Figure 8 : Hull Structure Report - 1

Bureau Veritas

Inland Navigation Management

TANKER - PLUS Record

Hull Structure

Vessel Name	Vessel Type	Date of Build
Class Society	**Register No.**	**Tanker-Plus Record Ref.**

Place(s) and date(s) of Surveys

This Report indicates the structural condition of the subject vessel's Hull Structure at survey completion.

Sections	Structure Index	Sections	Structure Index

A - Superior Condition	B - Good Condition	Average Structure Index Value	
C - Acceptable Condition	D - Poor Condition	**Overall Structural Condition Index**	
N/S - Not Surveyed	N/A Not Applicable	**Revised Overall Structural Condition Index**	

If the Overall Structural Condition Index was revised then give brief reason(s) for this in the space below:

BV Surveyor	Date	BV Stamp
Name:		
Signature:		

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Figure 9 : Hull Structure Report - 2

Bureau Veritas — **TANKER - PLUS Record**

Inland Navigation Management — **Hull Structure**

Vessel Name	Class Society	Tanker-Plus Record Ref.

A - Super Condition **C** - Acceptable Condition **Page** ☐ **of** ☐

B - Good Condition **D** - Poor Condition

N/S - Not Surveyed **N/A** - Not Applicable

No.	Vessel Sections	Visual Structure	Visual Coatings	Measured Wastage	Average Index Value
1	**Section:**				
	Average Section Index Value				
	Section Index				
	Revised Section Index				
2	**Section:**				
	Average Section Index Value				
	Section Index				
	Revised Section Index				
3	**Section:**				
	Average Section Index Value				
	Section Index				
	Revised Section Index				

Figure 10 : Hull Structure Report - 3

Bureau Veritas

Inland Navigation Management

TANKER - PLUS Record

Hull Structure

Vessel Name	Class Society	Tanker-Plus Record Ref.

Page ☐ **of** ☐

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Figure 11 : Machinery and Electrical Installations Report - 1

Bureau Veritas

TANKER - PLUS Record

Inland Navigation Management

Machinery, Systems and Electrical Installations

Vessel Name	Vessel Type	Date of Build
Class Society	**Register No.**	**Tanker-Plus Record Ref.**

Place(s) and date(s) of Surveys

This Report indicates the condition of the subject vessel's Machinery, Systems and Electrical Installations at survey completion.

Groups	Operation Index	Groups	Operation Index

A - Superior Condition B - Good Condition

C - Acceptable Condition D - Poor Condition

N/T - Not Tested N/A Not Applicable

Average Operation Index Value	
Overall Operational Condition Index	
Revised Overall Operational Condition Index	

If the Overall Operational Condition Index was revised then give brief reason(s) for this in the space below:

BV Surveyor	Date	BV Stamp
Name:		
Signature:		

Figure 12 : Machinery and Electrical Installations Report - 2

Bureau Veritas — TANKER - PLUS Record

Inland Navigation Management — Machinery, Systems and Electrical Installations

Vessel Name	Class Society	Tanker-Plus Record Ref.

A - Super Condition **C** - Acceptable Condition **Page** ☐ **of** ☐

B - Good Condition **D** - Poor Condition

N/T - Not Tested **N/A** - Not Applicable

No.	Hull Machinery Groups	Visual Condition	Function Test	Insulation Test	Average Index Value
1	**Group**				
	Average Group Index Value				
	Operational Group Index				
	Revised Operational Group Index				
2	**Group**				
	Average Group Index Value				
	Operational Group Index				
	Revised Operational Group Index				
3	**Group**				
	Average Group Index Value				
	Operational Group Index				
	Revised Operational Group Index				

Figure 13 : Machinery and Electrical Installations Report - 3

Bureau Veritas

Inland Navigation Management

TANKER - PLUS Record

Machinery, Systems and Electrical Installations

Vessel Name	Class Society	Tanker-Plus Record Ref.

Page ☐ **of** ☐

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