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CONDITION ASSESSMENT PROGRAMME

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GDAŃSK

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1 GENERAL INFORMATION

The Condition Assessment Programme (CAP) is an expertise on the technical ships condition independent from the classification.

Depending on request, CAP assessment may include the actual technical condition of:

- hull,
- machinery, electrical installation and cargo related system,
- hull, machinery, electrical installation and cargo related system.

The PRS CAP is generally aimed at assessing actual condition of oil tankers and chemical tankers. For other types of ships some criteria of assessment and rated items may differ from that for tankers.

Before the CAP survey, the client should inform PRS on requirements from potential characters, cargo owners etc.

The Owner should provide the necessary facilities for safe and effective surveys. All parts of the hull, machinery, electrical installation and cargo related system, if subject to CAP, shall be accessible, clean and prepared to the survey as agreed on by PRS.

At the signing of CAP contract PRS will appoint Head Office coordinator and field surveyor responsible for the CAP survey.

The client should notify PRS 8 weeks before the requested commencement of CAP survey and shall provide PRS with all necessary technical documentation (design drawings etc.) and information necessary for survey. Early notification is important in order to carry out strength analysis prior to CAP hull survey.

CAP rating has to be justified basing on the actual technical condition of the ship.

2 RATING SYSTEM

CAP rates the vessel in accordance with a rating scale from 1 (very good) to 4 (poor). Ratings have the following description:

CAP1 – very good condition

Hull structure with no evidence of defects, wastage, wear and tear.

At least 50% of allowable corrosion margin is remaining for structural members.

Coating system in at least “good condition” in each ballast tank, cargo tank, void space.

Strength evaluation according to current valid newbuilding rules in scope of: global structural strength evaluation and simplified fatigue analysis of main structural elements – shows compliance with rules requirements.

Machinery, electrical and cargo installation components and systems found with no deficiencies affecting the safe operation and normal performance.

Maintenance and documentation found to be very good.

CAP2 – good condition

Hull structure with minor deficiencies.

At least 25% of allowable corrosion margin is remaining for structural members.

Coating system in at least “fair” condition in each ballast tank, cargo tank, void space.

Strength evaluation according to current valid newbuilding rules in scope of: global structural strength evaluation and simplified fatigue analysis of main structural elements – shows acceptable compliance with rules requirements.

Machinery, electrical and cargo installation components and systems found with minor deficiencies not affecting the safe operation and normal performance.

Maintenance and documentation found in good order

<p>CAP3– satisfactory class condition Structure with deficiencies not affecting the minimum strength, normally accepted during class special survey. Less than 25% of allowable corrosion margin is remaining, there are no items with allowable corrosion margin exceeded. Coating system in “poor” condition. Satisfactory strength evaluation according to rules valid at the time of build in scope of hull section modulus. Machinery, electrical installation components and systems found with deficiencies not affecting the safe operation and normal performance, condition normally accepted during class special survey. Maintenance and documentation found to be satisfactory.</p>
<p>CAP4– poor condition Below class minimum standard. Items examined, measured, tested with deficiencies which may affect the ship’s potential to remain in class. Allowable corrosion margin is exceeded. Machinery and electrical installation components and systems found with deficiencies affecting the safe operation and normal performance. Documentation and maintenance found to be poor.</p>

3 CONDITION ASSESSMENT SURVEY

3.1 In order to record results of condition assessment survey in clear, transparent and quantitative way, rating of condition of structural elements has been applied.

3.2 The hull items assessed are:

- ballast tanks,
- void spaces,
- cargo tanks,
- hull external structure,
- structural strength.

Each tank/space assessment is based on ratings of the main structural elements i.e. fore transverse bulkhead, aft transverse bulkhead, side shell, longitudinal bulkhead, deck (deckhead), bottom, internal structure. To obtain particular CAP rating all applicable criteria as listed in p. 2 are to be met for structural elements.

An example of rating summary table for tank/space is shown below.

**Table 3.2
Tank/space rating summary**

Tank/space				
Elements	UTM	Visual	Coating	Overall
Fore transverse bulkhead				
Aft transverse bulkhead				
Side shell				
Longitudinal bulkhead				
Deck				
Bottom				
Internals				

Internals mean: web frames, girders, swash bulkheads, stringers.

Photographic evidence of the condition in each tank/space is to be enclosed to the report. Defects are to be described, photographed and repairs/upgrading works documented in like manner.

Guidelines to CAP Hull Survey and Assessment are given in Appendix 1.

The final CAP rating is decided by PRS Head Office after verification of documents from survey, results of structural strength analysis and applied repairs, upgrading works.

3.3 Machinery, electrical installation and cargo related systems scope of survey:

- perusal of the maintenance records,
- survey of the system and compartments,
- running tests,
- survey and tests of cargo related system (on tankers),
- internal survey of selected components,
- measurements of wear down figures,
- survey and tests of the safety systems, automation and remote control system,
- insulation resistance test,
- oil analyses,
- sea trails.

Photographic documentation reflecting the average condition is to be enclosed to the report.

Items are to be rated according to criteria given in p. 2.

4 STRUCTURAL STRENGTH ASSESSMENT

The global structural strength assessment is carried out on the basis of results of thickness measurements for typical cross sections in the midship area.

For CAP1 and CAP2 ratings, the current Rules for newbuildings are applied. The actual section modulus of the hull is to be: for CAP1 – not less than 95% of the section modulus required for newbuilding, for CAP2 – not less than 93%. For CAP3 rating, the actual section modulus of the hull calculated according to Rules in force during construction of the ship is to be not less than 90% of the required by the rules.

For CAP1 and CAP2 ratings, the analysis of buckling capacity of plates and stiffeners of the ship's hull structure is carried out according to current Rules for newbuildings.

The actual, as measured, thickness decreased by corrosion allowance for remaining lifetime of the structure is used for calculation.

For CAP1 and CAP2 ratings, for tankers of deadweight more than 20000 t, simplified fatigue analysis of main structural nodes is carried out according to current valid Rules for newbuildings taking into account remaining lifetime of the structure.

Some steel renewals, reinforcements or other measures resulted from a/m analyses may be required to be applied in order to satisfy the requirements for CAP1, CAP2 or CAP3 ratings.

5 CAP HULL REPORT

CAP hull report consists of:

- particulars of the ship,
- general information on PRS CAP ratings,
- course of actions during survey, scope of surveys,
- descriptions and ratings for main structural elements in each tank/space,
- structural strength analysis and required measures to satisfy target rating,
- description and photos of defects,
- description of repairs and upgrading works,
- photographic evidence of the condition in each tank/space,
- CAP rating summary,
- Head Office decision on final rating,
- Analysis of UTM data for each main structural element in each tank/space (enclosure to Report).

6 CAP REPORT ON MACHINERY, ELECTRICAL INSTALLATIONS, CARGO RELATED SYSTEM

CAP report consists of:

- particulars of the ship,
- course of actions during survey, scope of surveys,
- findings of all tests, survey, safety checks and measurements,
- photographic evidence of the average condition of components and systems,
- surveyor's proposal of CAP rating,
- Head Office decision on final rating,
- Representative measurements taken during CAP surveys (enclosure to the Report).

7 FINAL RATING BY HEAD OFFICE TEAM

All reports are verified by Head Office team of specialists.

The team consists of senior PRS specialists, appointed by Director for Ship Division, representing relevant disciplines. The team decides the final CAP Rating. Final CAP1, CAP2 or CAP3 ratings cannot be granted when relevant requirements listed in p. 2 have not been fulfilled.

8 CAP CERTIFICATE

A CAP Certificate is issued after completion of the Condition Assessment Program.

The certificate will contain:

- the vessel identification data,
- the place and period of survey,
- a summary assessment of hull/machinery and cargo systems,
- comments (if any).

The certificate will give no period of validity.

APPENDIX 1

Guidance to CAP Hull Survey and Assessment

1. This assessment takes into consideration UTM results, visual assessment of structure, assessment of coating, tank tests for tightness and results of strength calculation.

2. The items assessed are:

- ballast tanks,
- void spaces,
- cargo tanks,
- hull external structure (main deck, ship sides, bottom),
- structural strength.

3. UTM based assessment

The purpose of the analysis of UTM is to establish the extent of general corrosion.

Extensive UTMs are to give representative data for strength structural elements (i.e. plating, stiffeners and internals in all tanks) and hull girder structure elements (deck, double bottom, ship sides). Areas between web frames should be also taken into account.

Minimum scope of thickness measurement should be not less than that given for renewal survey in *PRS Publications: No. 58/P – Hull surveys of double hull oil tankers* and *No. 46/P – Hull surveys of chemical tankers*.

As regard voids spaces, thickness measurements are to give representative data for plating, stiffeners and internals; at least three transverse sections are to be measured.

Extent of thickness measurements for other types of ships will be considered in each particular case.

Ratings:

- CAP1 – at least 50% of allowable corrosion margin is remaining for each structural member,
- CAP2 – at least 25% of allowable corrosion margin is remaining for each structural member
- CAP3 – less than 25% allowable corrosion diminution is remaining but still in class limits, there are no items with allowable corrosion margin exceeded,
- CAP4 – below class limits, allowable corrosion margin is exceeded.

Relevant ratings for structural elements should be written down in Table 4 (see Appendix 1, p.4).

4. Visual assessment of structural condition

The purpose of visual inspection is to assess extent of defects and local corrosion (including pitting, grooving, edge corrosion).

Minimum scope of overall and close-up surveys is not to be less than that required for renewal survey in *PRS Publications: No. 58/P – Hull surveys of double hull oil tankers* and *No. 46/P Hull surveys of chemical tankers*.

Void spaces are to be surveyed at least in scope of overall inspection.

All fatigue critical details i.e. details identified in fatigue assessment calculations are to be close-up surveyed.

Ratings:

- CAP1 – “Very good” – structure with no evidence of defects wastage, wear and tear,
- CAP2 – “Good” – structure is to be without cracks, distortions, indentations, buckles. Pitting intensity less than 20% is accepted. Thickness of material in a place of pitting or edge corrosion is to be not less than 0.8 of as-built thickness or 0.8 of the thickness calculated during strength analysis (if any). Grooving depth is to be not more than 8% of the thickness of structural member.
- CAP3 – “Fair” – below requirements for “good” but satisfactory for class renewal survey,
- CAP4 – “Poor” – below requirements for “fair” condition.

Relevant rating for structural elements are to be written down in Table 1.

Table 1
Visual assessment of tank/space

Tank/space							
Elements	Cracks	Buckles/ indentations	Pitting	Grooving	Edge corrosion	Other	Overall rating
Fore transverse bulkhead							
Aft transverse bulkhead							
Side shell							
Longitudinal bulkhead							
Deck							
Bottom							
Internals							

Overall rating – is the lowest rating of components.

Internals mean: web frames, girders, swash bulkheads, stringers.

5. Condition coating assessment for tanks/spaces

Condition coating assessment is a part of main structural elements assessments.

Classification and examples of “Good”, “Fair” and “Poor” condition of coating are given in *IACS recommendation No. 87 “Guidelines for coating for coating maintenance & repairs for ballast tanks and combined cargo/ballast tanks on oil tankers”* (see also Table 2 – below).

Table 2
IACS clarification of “GOOD”, “FAIR” and “POOR” coating condition.

	GOOD ⁽³⁾	FAIR	POOR
Breakdown of coating or area rusted ⁽¹⁾	< 3%	3 – 20%	> 20%
Area of hard rust scale ⁽¹⁾	–	< 10%	≥ 10%
Local breakdown of coating or rust on edges or weld lines ⁽²⁾	< 20%	20 – 50%	> 50%
Notes:			
(1) % is the percentage of the area under consideration or of the “critical structural area”.			
(2) % is the percentage of edges or weld lines in the area under consideration or of the “critical structural area”.			
(3) spot rusting i.e. rusting in spot without visible failure of coating.			

Ratings:

CAP1 – coating condition corresponding to “Good”,

CAP2 – coating condition corresponding to “Fair”

CAP3 – coating condition corresponding to “Poor”

CAP4 – N/A.

Ratings of coating condition are to be written down in Table 3 (below).

Table 3
Coating assessment of tank/space

Tank/space	Area under consideration			
Elements	Upper part	Middle part	Lower part	Overall rating
Fore transverse bulkhead				
Aft transverse bulkhead				
Side shell				
Longitudinal bulkhead				
Deck				
Bottom				
Internals				

Upper part, Middle part, lower part – only for vertical elements.
Internals mean: web frames, girders, swash bulkheads, stringers.

6. Tank/space assessment

Each tank/space assessment is based on ratings of the main structural elements i.e. fore transverse bulkhead, aft transverse bulkhead, side shell, longitudinal bulkhead, deck, bottom, internals. Longitudinals and vertical stiffeners are part of main structural element they are attached to.

Relevant ratings corresponding to UTM, visual and coating assessment are to be written down in Table 4 (below)

Table 4
Tank/space summary rating

Tank/space	Area under consideration			
Elements	UTM	Visual	Coating	Overall
Fore transverse bulkhead				
Aft transverse bulkhead				
Side shell				
Longitudinal bulkhead				
Deck				
Bottom				
Internals				

Overall rating – is the lowest rating of UTM, visual and coating.
Internals mean: web frames, girders, swash bulkheads, stringers.

7. Hull external structure rating

Main deck, bottom and ship sides are to be rated in similar way as tanks/spaces.

Table 5
Hull external structure rating

Hull External Structure				
Item	UTM	Visual	Coating	Overall
Deck				
Shipside				
Bottom				

8. Structural strength rating

The rating is carried out on the basis of the ship global and fatigue strength analyses. The analyses are carried out by Head Office departments, according to p.4 of this Publication.

When some renewals, reinforcements or other measures are required, as a result of above mentioned analyses in order to satisfy target rating, relevant information is passed to the Orderer and to PRS field surveyors, engaged in CAP.

Above mentioned works and other measures, when carried out, are to be described in CAP Hull Report (supplemented by relevant sketches, photos) and resulting rating is to be proposed in the Report.
