CLASS Condition Assessment Programme. - CAP

What is CAP?
CAP is today’s best quality measurement tool for older vessels focusing on technical and functional condition. The programme is designed for tankers and bulk carriers older than 15 years but may well be used for other types of tonnage and at any age.

(For vessels below 3000 dwt CAP is replaced by a Condition Survey.)

The Condition Assessment Programme documents the condition and rates the vessel in accordance with a rating scale from 1 (best) to 4 (lowest).

Well maintained older tonnage with rating of minimum 2 (documented good standard) becomes more attractive to charterers, state and harbour authorities as well as terminal owners.

CAP is a voluntary service to shipowners, and is a supplement to classification.

Class implies that a vessel has a technical standard equal to or better than a minimum standard (defined by Class Rules), while CAP describes and specifies the actual standard on board at the time of inspection.

Purpose
- To have the vessel judged based on the actual situation on board rather than age
- To contribute to ensuring safest possible transportation of the cargo
- To obtain documentation on the Owners/managing company’s own standards (audit)
- To establish a sound basis for decisions on repair or investments in order to extend the lifetime of the vessel
- To document a vessel’s technical condition towards/in connection with:
  - Underwriters
  - Cargo owners and/or authorities in connection with entry into new charters or renewal of existing ones beyond expire dates.
  - Refinancing of the vessel.
- Sale or termination of management agreements etc.

DIFERENCE BETWEEN CAP AND CLASS

CAP RATING SCALE
Scope
CAP may cover the whole vessel or parts of it only. This is up to the owner to decide. CAP may consist of the following modules:
• Hull
• Cargo handling systems and equipment
• Machinery systems
• Fatigue analysis.

Examination of records is carried out in order to find special events or deviations from normal operation.
Structural strength calculations are made to compare the vessel with current newbuilding requirements.
Steel diminution distribution curves are presented for any structural member, tank or the vessel as a whole and compared to original and minimum allowable steel dimensions.
Cargo handling systems are assessed relative to functionality and capacity as specified in respective specifications for the equipment.
Machinery systems are assessed relative to functionality, capacity and deviations from installation specifications and evaluated against predefined criteria. Indicator diagram evaluations as well as vibration measurements and oil sample analyses are carried out.

Inspection and Measurements
• Close up inspection of hull structure
• Performance witnessing of cargo systems and machinery
• UTM of hull structure and piping
• Measurements of machinery indicator diagrams
• Oil sampling from systems and machinery
• Vibration measurements

Scale of Rating
A rating system ranging from 1 (best) to 4 (lowest) has been established.
A Rating Committee establishes the final rating.

CAP Declaration
The CAP rating awarded by the Rating Committee is stated in the CAP declaration and reflects the condition of the vessel at the time of inspection(s).
Charterers have introduced their own acceptance periods related to the rating stated in the CAP Declaration.

CAP Report
The CAP documentation consist of
• Statement of facts including particulars of the vessel
• Executive summary of findings from inspection and analyses
• Technical reports containing descriptions, observations and ratings
• Photographic evidence where the average condition is reflected together with the extremities (best and worst), to verify the basis for the rating
• Detailed reports on indicator diagrams, oil analysis and vibration measurement analysis

Hull Structure Rating Definitions

CLASS STANDARD

1 Items examined and measured found with only superficial reductions from as new of current rule scantlings. No maintenance or repair required.

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

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

4 BELOW CLASS STANDARD
Items examined and measured either found to have a deficiency or deficiencies which may affect the ship's potential to remain in class, or found to have, in some areas, thicknesses which are at or below the class renewal levels.
THICKNESS MEASUREMENT SPECIFICATION FOR CLASS CONDITION ASSESSMENT PROGRAMME (CAP) HULL

1. Objective

1.1 This specification describes the extent of thickness measurements required for CLASS Condition Assessment Programme (CAP) Hull. Requirements to thickness measurements for class surveys are specified in CLASS Rules for Classification of Ships.

1.2 CLASS uses thickness measurement data for a statistical analysis of diminution as a basis for the CAP rating. Representative data for all main structural elements in all tanks/spaces are required. The main structural elements in a CAP context are deck, ships, bottom, inner bottom, inner deck, longitudinal bulkhead, transverse bulkhead (i.e. tank/space boundaries with plating and stiffeners) and internal structure (i.e. webframes, stringers, girders, floors etc.).

1.3 Failure to carry out thickness measurements according to this specification may prevent completion of CAP.

2. General

2.1 Thickness measurements shall be carried out by a qualified company approved by CLASS.

2.2 A CLASS surveyor shall be onboard while the measurements are taken to the extent necessary to control the process.

2.3 The thickness measurements data shall be reported using the “CLASS UTM Template”. All information required in the template is to be completed by the thickness measurement company. The “CLASS UTM Template”

2.4 One electronic version and one paper version of the thickness measurement report with sketches and relevant documentation is to be submitted to the responsible CLASS unit.

2.5 Readings to be included in the thickness measurement report shall be representative for the area measured and shall normally be single point readings. If a single reading is not considered to be representative for the area it represent, additional readings may be carried out in same area and included in the report together with a comment stating that these are additional readings. Alternatively, the average value of several readings in a small area may be included in the report together with a comment stating that this is an average value. In such cases all the readings to be averaged are to be taken within the affected area. Low readings shall not be averaged out by several readings in adjacent uncorroded areas.

2.6 Pits, grooves and local corrosion are to be measured and included in the report with a suitable comment.

2.7 Cracks, buckling and other deficiencies identified are to be reported to the attending CAP surveyor and included as comments/sketches in the thickness measurement report.
3. Standard Extent of Thickness Measurements

3.1 The standard extent of measurements is described in this section. Reductions in the standard extent of measurements are only accepted in accordance with criteria listed in Section 4.

3.2 The following structure is to be completely measured with 5 points per plate:
- Exposed main deck plating
- Bottom plating
- Wind and water strakes
- Inner bottom plating
- Continuous longitudinal stringers and inner deck plating

3.3 Three transverse sections in the cargo area are to be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements. The transverse sections are normally to be located outside the line of cargo hatch openings if fitted. The complete section is to be measured, including:
- Within 0.15D (where D is the moulded depth of the ship) from deck and bottom every longitudinal and girder shall be measured on the web and flange and every plate shall be measured one point between each longitudinal.
- Between deck and bottom area every longitudinal and girder shall be measured on the web and flange and every plate strake at least one point per plate.

3.4 All tanks in the cargo area are to be measured in three transverse belts for each tank, normally located in the forward, middle and aft parts of the tank. Measurements in two transverse belts are sufficient for tanks of less than 15 metres length. All structure in and adjacent to these belts are to be measured, including:
- Longitudinals and other stiffeners with one representative measurement on both web and flange.
- Ship side (outside wind and water strakes) and longitudinal bulkhead plates (2 points per plate strake).
- Stringer platforms with associated structure (2 points per plate).
- Transverse bulkheads including swash bulkheads with associated structure (plates and stiffeners at three horizontal levels).
- Web frames with flanges, stiffeners and brackets.

3.5 The following structure is to be measured in fore and aft peak tanks:
- All transverse webs with associated plating and longitudinals.
- Transverse bulkhead complete with associated structure.
- Deckhead (tanktop) and stringers with associated structure.
- Bottom and shipside with stiffeners.

3.6 Any other ballast tanks outside of cargo area are to be measured as described in Section 3.4.

3.7 For cofferdams, voids and other spaces in the cargo area, representative thickness data for all main structural elements are required.

3.8 Cargo hatches with coamings and associated structure are to be measured for all holds.
3.9 Additional measurements are to be carried out if one or more readings indicate corrosion exceeding requirement to CAP 2 (67 % of allowable margin). “Requirements for extent of thickness measurements at those areas of substantial corrosion” in CLASS Rules for Classification of Ships should be used for guidance.
3.10 Extent of measurements may be increased as considered necessary by the attending CAP surveyor.

4. Reduced Extent of Measurements

4.1 Extent of measurements in shell plating (ref. Section 3.2) and in three transverse sections in cargo area (ref. Section 3.3) is not to be reduced.

4.2 The number of readings may only be reduced if the structure in question is:
   - made of solid stainless steel, or
   - coated with original coating still intact on both sides of the structure, or
   - located within fuel or cargo tank(s) and
   - representative thickness measurements reveal no or negligible steel loss, well within the requirements for CAP 1 (33 % of allowable margin). The representative measurements are to be taken in areas expected to represent worst case corrosion.

4.3 Where the number of thickness measurements is reduced, it is to be ensured that representative measurements are obtained for all main structural elements (ref. Section 1.2) in all tanks/spaces. An absolute minimum of 10 representative readings for each main structural element in all tanks/spaces are required. If measurements reveal that the conditions given in Section 4.2 are not met, the standard extent of measurements as described in Section 3 is to be carried out.

4.4 No reduction in extent of measurements is to be applied unless accepted by the attending CAP surveyor.
The Class IACS Condition Assessment Program (CAP)

Ship's conditions can remain of a good level throughout their service lives if they are operated in an appropriate manner, the current state of construction and equipment of each ship or structure are clearly understood, and inspections and maintenance are carried out regularly and properly.

Ships should be surveyed periodically to verify that they are maintained in an acceptable condition in accordance with international conventions, the Rules of Classification societies, etc. Detailed ship conditions, however, can not usually be all assessed by the regular surveys. A detailed assessment of ship condition is very important for the owner's maintenance program through a ship's service life.

The IACS Condition Assessment Program (CAP) is a specialized survey program which offers owners a detailed assessment of a ship's actual condition, based on strength evaluation, and fatigue strength analysis as well as a detailed on site systematic inspection of the hull, machinery and cargo systems. With the CAP, owners can be confident that they have an accurate assessment of the ships actual condition, especially as far as the condition compares with the normal Class requirements.

The CAP applies, in principle, to oil tankers and chemical carriers, though other types of ships may be covered, provided that the CAP is properly modified.

The CAP consists of two major parts which can be applied independently depending on the needs of the applicant.

1. CAP-HULL (Condition Assessment for Hull Structures)
2. CAP-MACHINERY/CARGO SYSTEM (Condition Assessment for Machinery and Cargo Systems)

The results of condition assessment are clearly identified using a rating system. The definitions corresponding to each rating are indicated below.

(1) CAP-HULL RATING

(a) Rating Level 1: "Very Good Condition" Items examined and measured found with only superficial reductions from "as new" or current rule scantlings. No maintenance or repair required.

(b) Rating Level 2: "Good Condition" Items examined and measured found to have deficiencies of a minor nature not requiring correction or repair and/or found to have all thicknesses significantly above class limits.

(c) Rating Level 3: "Satisfactory Condition" Items examined and measured either found to have deficiencies, which do not require immediate corrective action, or found to have thicknesses, which although generally above class renewal levels, do exhibit substantial corrosion.

(d) Rating Level 4: "Unsatisfactory Condition" Items examined and measured either found to have a deficiency or deficiencies which may affect the ship's potential to remain in class, or found to have, in some areas, thicknesses which are at or below the class renewal levels.
(2) CAP-MACHINERY/CARGO SYSTEM RATING

(a) Rating Grade 1: "Very Good Condition" Items and systems examined and function tested, found with no deficiencies affecting safe operation and/or performance. Documentation and maintenance practices considered good. No maintenance or repair required.

(b) Rating Grade 2: "Good Condition" Items and systems examined and function tested, found with some minor deficiencies which do not affect safe operation and/or normal performance. Documentation and maintenance practices considered adequate. No immediate maintenance or repair considered necessary.

(c) Rating Grade 3: "Satisfactory condition" Items and systems examined and function tested, found with deficiencies not affecting safe operation and/or performance. Documentation and maintenance practices considered to be of a minimum standard. Some maintenance and repair may be considered necessary.

(d) Rating Grade 4: "Unsatisfactory condition" Items and systems examined and function tested, found with deficiencies significantly affecting operation and/or performance. Documentation and maintenance practices considered inadequate. Maintenance and repair required to reinstate serviceability.

After the completion of the CAP, the certificate of CAP indicating the ship's comprehensive rating (Overall Rating for CAP-HULL and/or CAP-MACHINERY / CARGO SYSTEM) is issued. Detailed assessment results and the relevant records shown below are attached to the certificate of CAP.

(1) CAP-HULL

(a) CAP-HULL rating for each structural group and strength evaluation
(b) Survey record
(c) Report for fatigue strength assessment
(d) Rating for corrosion protection systems of water ballast tanks and coated cargo tanks
(e) Photographic report
(f) Thickness measurement record

(2) CAP-MACHINERY/CARGO SYSTEM

(a) CAP-MACHINERY/CARGO SYSTEM rating for each item
(b) Survey record
(c) Photographic report