Guidance for Condition Assessment Scheme (CAS)

Regulation 13G of MARPOL Annex I

ClassNK

August 2004

1. INTRODUCTION

After the disaster of **Prestige**, IMO adopted the amendments to the regulation 13G of MARPOL 73/78 Annex I for further acceleration of the phase-out timetable for the single hull oil tankers and consequentially adopted the amendments to Condition Assessment Scheme (CAS).
The amendments to these regulations will enter into force on **5 April 2005.**

2. APPLICATION

The requirements of the CAS apply to the "Category 2 Oil Tankers" and "Category 3 Oil Tankers". "Category 1 Oil Tankers" delivered on 5 April 1982 or earlier shall be phased-out on 5 April 2005 and are not applicable for compliance with CAS.

For the purpose of regulation 13G and CAS, oil tankers are divided into the following categories:

(a) **"Category 1 Oil Tanker"** means an oil tanker of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying oil other than the above, which does not comply with the requirements for new oil tanker as defined in regulation 1(26) of MARPOL Annex I.

(b) **"Category 2 Oil Tanker"** means an oil tanker of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying oil other than the above, which does complies with the requirements for new oil tanker as defined in regulation 1(26) of MARPOL Annex I.

(c) **"Category 3 Oil Tanker"** means an oil tanker of 5,000 tons deadweight and above but less than that specified in above (a) or (b).

3. IMPLEMENTATION

The first CAS survey shall be carried out concurrent with the first intermediate or renewal survey:

- after 5 April 2005, or
- after the date when the ship reaches 15 years of age,

whichever occurs later.

4. SURVEY REQUIRENTS

CAS is intended to complement the requirements of the Enhanced Survey Programme during surveys of oil tankers. Therefore, the CAS shall apply to survey of hull structure in way of cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area and all ballast tanks, and the CAS shall not apply to survey of Machinery, Equipment, Fire extinction and Fittings.

4.1 Close-up Survey

IACS Unified Requirements Z10.1 regarding the Enhanced Survey Programme has been revised (corresponding NK Rules entered into force on 1 January 2004), and the requirements of close-up survey at Special Survey No.3 are now the same as those of CAS.

As for the acceptance criteria, there are no differences between CAS and Class survey.

4.2 Thickness Measurements

As shown in **Table 1**, extent of thickness measurements for the CAS survey is enhanced than those for Special Survey No.3.

Table 1

Extent of Measurements Requirements for CAS
1. Within the cargo area: .1 Each deck plate .2 Three transverse sections *(two transverse section in case of SS No.3)* .3 Each bottom plate
2. Measurements of structural members subject to close-up survey according to 7.2.2, for general assessment and recording of corrosion pattern
3. Suspect areas
4. Selected wind and water strakes outside the cargo area.
5. All wind and water strakes within the cargo area.
6. Internal structure in the fore and aft peak tanks
7. All exposed main deck plates outside the cargo area and all exposed first tier superstructure deck plates

Notes: Underlined part shows the extent of thickness measurements enhanced by CAS

4.3 CAS Procedural Requirements

From the technical point of view, there are no substantial differences between CAS and Class Survey. However, the procedural requirements of CAS differ from those of Class survey as shown below.

- Sufficient time for survey preparation and development of survey plan
- Monitoring and instruction to RO(NK) by the Flag Administration
- Final assessment and issuance of Statement of Compliance by the Flag Administration

5. PREPARATIONS FOR THE CAS SURVEY

Notification from the Owner to the Flag Administration and to NK of its intention to proceed with the CAS shall be submitted not less than 8 months prior to the planned commencement of the CAS survey.

The Owner shall complete and submit the **Survey Planning Questionnaire** to NK not less than 5 months prior to the planned commencement of the CAS survey. A copy of the completed questionnaire shall be forwarded by the Owner to the Flag Administration.

The **Survey Plan** for the CAS shall be completed and submitted in signed order by the Owner to NK not less than 2 months prior to the planned commencement of the CAS survey. A copy of the Survey Plan for the CAS shall be forwarded by the Owner to the Flag Administration.

6. IMPLEMENTATION

As mentioned above, sufficient time for preparation and detailed survey planning are required prior to the commencement of the CAS survey. Therefore, the CAS survey is not complete unless all recommendations/conditions of class which relate to hull structures under review by the CAS survey have been rectified to the satisfaction of NK.

7. CAS SURVEY RECORD AND INTERIM STATEMENT OF COMPLIANCE

Upon satisfactory completion of the CAS survey, the attending surveyors shall prepare the CAS Survey Reports in order to submit to NK Head Office and issue an **Interim Statement of Compliance** for a period not exceeding 5 months.

CAS survey record, including repair items, shall form an auditable documentary trail, which shall be made available to the Flag Administration, and the narrative report shall be supplemented by documents, damage plan, repair plan and photographs in addition to the detailed survey results for each compartment.

8. CAS FINAL REPORT TO THE ADMINISTRATION

NK Head Office shall carry out a verification review of the CAS Survey Reports and prepare a CAS Final Report. The CAS Final Report shall be submitted to the Administration not later than 3 months after completion of the CAS survey.

9. VERIFICATION BY THE FLAG ADMINISTRATION AND ISSUANCE OF STATEMENT OF COMPLIANCE

Differentia of CAS as compared with the Class Survey are the monitoring and verification by the Flag Administration (Thus, CAS is the MARPOL statutory survey).
The Flag Administration, for the purpose of ensuring the implementation of CAS, carries out:

- Monitoring and instruction to NK for preparation and implementation of CAS;
- Review of CAS Final Report;
- Issuance of Statement of Compliance
- Communication to the IMO regarding CAS results

The Administration shall review the CAS Final Report, and if satisfactory, issue the **Statement of Compliance**. The validity of the Statement of Compliance shall not exceed 5 years and 6 months from the date of completion of the CAS survey.

10. CAS TIME SCHEDULE

CAS time schedule is shown in **Table 2**. The strict timeframes are set from the preparatory stages up to implementation, reporting and further issuance of Statement of Compliance. The relevant parties (Owner, Flag Administration and NK) are to comply with these timeframes.

11. OPERATION OF OIL TANKER BEYOND THE YEAR OF 2010

The oil tanker, intended operation beyond the anniversary of the date of delivery of the ship in 2010, shall have and hold the CAS Statement of Compliance, subject to the authorization by the Administration in accordance with the regulation 13G(7) of MARPOL 73/78 Annex I.

In the case that the Statement of Compliance issued following the first CAS survey at the period above mentioned **3.** is valid beyond the anniversary of the date of delivery of the ship 2010, that CAS Statement of Compliance may be treated as compliance with regulation 13G(7).

According to the regulation 13G(8), however, the Administration of a Party to the MARPOL 73/78 shall be entitled to deny entry into the ports or offshore terminals under its jurisdiction of oil tankers operating beyond the anniversary of the date of delivery of the ship 2010.
As of December 2003, the 15 Member States of the European Union (at that time), Cyprus, Malta and Poland declared ban on entry into their ports or offshore terminals. UAS shall also ban any entry beyond 2010 in accordance with its domestic law (OPA 90).

12. CONTACT IN NK

For any questions about CAS, please contact Survey Department.

Microsoft Word version of the **Survey Planning Questionnaire** and the **Model Survey Plan for NK Ships** is available, and if needed, please contact Survey Department.

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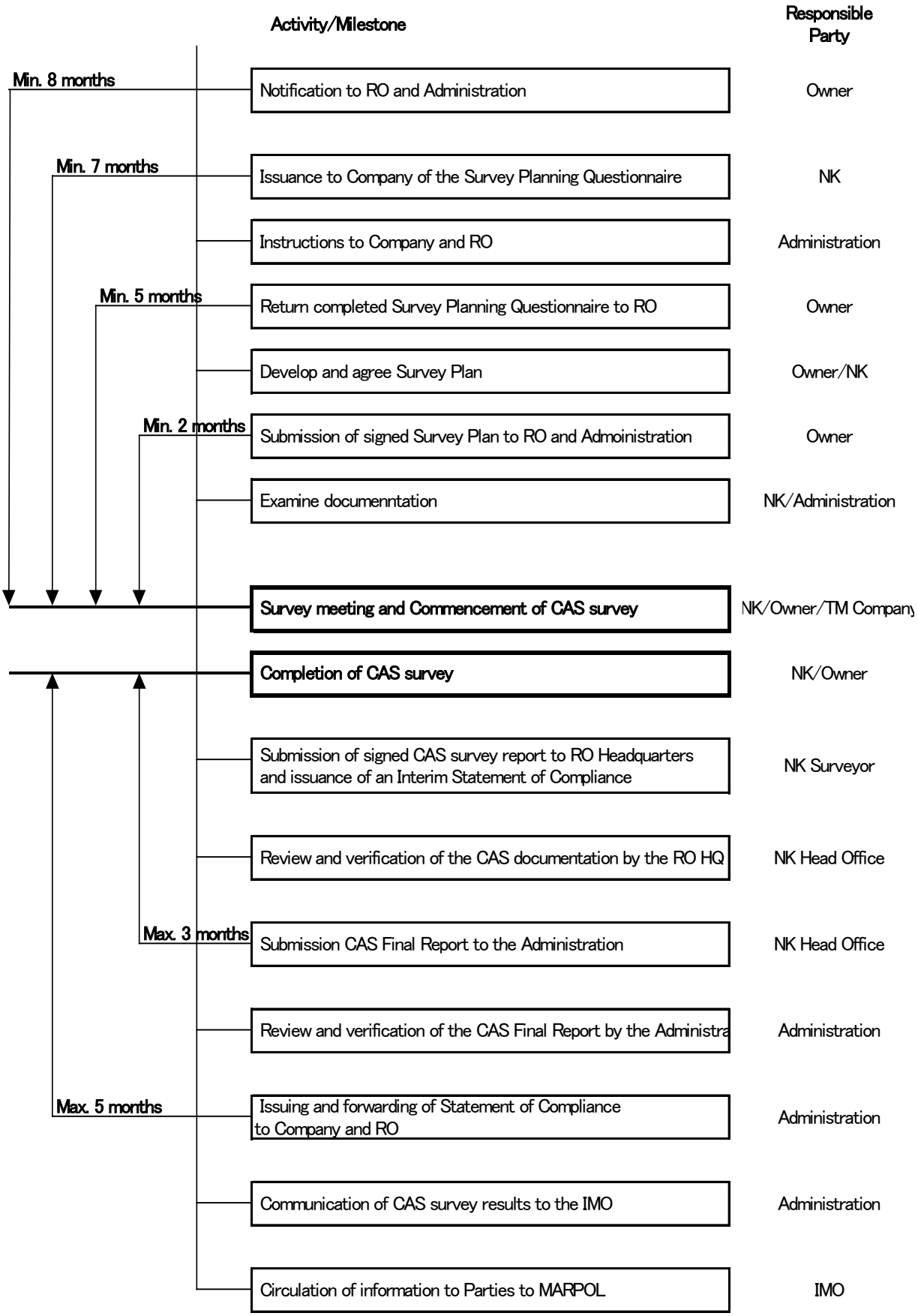
Table 2 CAS Time Schedule



ATTACHMENTS:

1. **Condition Assessment Scheme**
2. **Survey Planning Questionnaire**
3. **Model Survey Plan for NK Ships**
4. **Amendments to regulation 13G of MARPOL73/78 Annex I**

CONDITION ASSESSMENT SCHEME
(MEPC.94(46), as amended)

1 PREAMBLE

1.1 The Condition Assessment Scheme (CAS) is intended to complement the requirements of Annex B of the Guidelines on the enhanced programme of inspections during surveys of bulk carriers and oil tankers (hereinafter called Enhanced Survey Programme), adopted by the Assembly of the International Maritime Organization by resolution A.744(18), as amended. The CAS is to verify that the structural condition of single hull oil tankers at the time of survey is acceptable and, provided subsequent periodical surveys are satisfactorily completed and effective maintenance is carried out by the ship's operator, will continue to be acceptable for a continued period of operation, as indicated in the Statement of Compliance or Interim Statement of Compliance, as applicable.

1.2 The requirements of the CAS include enhanced and transparent verification of the reported structural condition and of the ship and verification that the documentary and survey procedures have been properly carried out and completed.

1.3 The Scheme requires that compliance with the CAS is assessed during the Enhanced Survey Programme of Inspections concurrent with intermediate or renewal surveys currently required by resolution A.744(18), as amended.

1.4 The CAS does not specify structural standards in excess of the provisions of other International Maritime Organization conventions, codes and recommendations.

1.5 The CAS has been developed on the basis of the requirements of resolution A.744(18), as amended, which were known* at the time of the adoption of the CAS. It is the intention to update the CAS as and when the need arises following amendments to resolution A.744(18), as amended.

2 PURPOSE

The purpose of the Condition Assessment Scheme is to provide an international standard to meet the requirements of regulation 13G(6) and (7) and 13H(6)(a)** of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended by resolution.

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* Assembly resolution A.744(18) as amended by resolution 2 of the 1997 SOLAS Conference, by resolution MSC.49(66) and by resolution MSC.105(73).

** Incorporated from resolution MEPC.112(50)

3 DEFINITIONS

For the purpose of the CAS, unless expressly provided otherwise:

3.1 **"MARPOL 73/78"** means the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973, as amended.

3.2 **"Regulation"** means the regulations contained in Annex I of MARPOL 73/78.

3.3 **"Recognized Organization (RO)"** means an organization recognized by the Administration to perform the surveys in accordance with the provisions of regulation 4(3) of Annex I of MARPOL 73/78*.

3.4 **"Administration"** means the Government of the State as defined in Article 2(5) of MARPOL 73/78.

3.5 "**Category 2 oil tanker"** means an oil tanker of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying oil other than the above, which complies with the requirements for new oil tankers as defined in regulation 1(26) of Annex I of MARPOL 73/78.

3.6 **"Category 3 oil tanker"** means an oil tanker of 5,000 tons deadweight and above but less than specified in regulation 13G(3)(a) or (b) of Annex I of MARPOL 73/78.**

3.7 **"Company"** means the owner of the ship or any other organization or person such as the manager or the bareboat charterer, who has assumed the responsibility for the operation of the ship from the owner of the ship and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the International Safety Management (ISM) Code.

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

3.9 **"GOOD condition"** means a coating condition with only minor spot rusting.

3.10 **"Thickness Measurement (TM) Firm"** means a qualified company certified by a RO in accordance with the principles stipulated in annex 7 to Annex B to resolution A.744(18), as amended.

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* Under Regulation XI/1 of SOLAS 74, as amended, resolutions A.739(18) and A.789(19) are applicable to Recognized Organizations.

** Incorporated from resolution MEPC.112(50)

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

3.12 **"Suspect Areas"** are locations showing substantial corrosion and/or are considered by the attending surveyor to be prone to rapid wastage.

3.13 **Organization"** means the International Maritime Organization.

4 GENERAL PROVISIONS

4.1 The Administration shall issue, or cause to be issued, detailed instructions to the RO which shall ensure that the CAS surveys are carried out in accordance with the provisions of sections 5 through 10 of this Scheme.

4.2 Nothing in this Scheme shall prevent an Administration from carrying out the CAS surveys itself, provided that such surveys are at least as effective as those prescribed in sections 5 through 10 in this Scheme.

4.3 The Administration shall require Category 2 and Category 3 oil tankers flying its flag which are subject to the provisions of regulation 13G(7) to remain out of service during the periods referred to in paragraphs 5.1.2, until these oil tankers are issued with a valid Statement of Compliance.**

5 APPLICATION, SCOPE AND TIMING

5.1 Application

The requirements of the CAS apply to:

.1 oil tankers of 5,000 tons deadweight and above and of 15 years and over after date of delivery of the ship, in accordance with regulation 13G(6);**

.2 oil tankers subject to the provisions of regulation 13G(7), where authorization is requested for continued service beyond the anniversary of the date of delivery of the ship in 2010; and

.3 oil tanker of 5,000 tons deadweight and above and of 15 years and over after date of delivery of the ship, carrying crude oils as cargo having a density at 15℃ higher than 900 kg/m^3 but lower than 945 kg/m^3, in accordance with regulation 13H(6)(a).**

** Incorporated from resolution MEPC.112(50)

5.2 Scope of the CAS

The CAS shall apply to surveys of the hull structure in way of cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area and all ballast tanks.

5.3 Timing

5.3.1 The CAS survey shall be aligned to the Enhanced Programme of Inspection.**

5.3.2 The first CAS survey in accordance with regulation 13G(6) shall be carried out concurrent with the first scheduled intermediate or renewal survey after 5 April 2005, or when the ship reaches the 15 years of age, whichever occurs later.**

Unified Interpretation to paragraph 5.3.2 (Annex 12 of MEPC.51/22)
"The first CAS survey shall be carried out concurrent with the first intermediate or renewal survey:
- *after 5 April 2005, or*
- *after the date when the ship reaches 15 years of age,*

whichever occurs later."

5.3.3 The first CAS survey in accordance with regulation 13G(7) shall be carried out concurrent with the scheduled intermediate or renewal survey due prior to the anniversary of the date of delivery of the ship in 2010.**

5.3.4 The first CAS survey in accordance with regulation 13H(6)(a) shall be carried out concurrent with the first scheduled intermediate or renewal survey after 5 April 2005.**

5.3.5 In the case that the Statement of Compliance issued following the first CAS survey under 5.3.2 is valid beyond the anniversary of the date of delivery of the ship in 2010, that CAS may be treated as the first CAS carried out in accordance with regulation 13G(7).**

5.3.6 Any subsequent CAS survey, required for the renewal of the Statement of Compliance, shall be carried out at intervals not exceeding 5 years and 6 months.**

5.3.7 Notwithstanding the above, the Company may, with the agreement of the Administration, opt to carry out the CAS survey at a date earlier than the due date of the survey referred to above, provided that all the requirements of the CAS are complied with.**

6 SURVEY PLANNING REQUIREMENTS

6.1 Preparations for the CAS survey

6.1.1 General procedures

6.1.1.1 Early and detailed planning to identify areas of potential risk is a prerequisite for the successful and timely completion of the CAS. The following sequence of events shall be observed.

** Incorporated from resolution MEPC.112(50)

6.1.1.2 Notification from the Company to the Administration and to the RO of its intention to proceed with the CAS shall be submitted not less than 8 months prior to the planned commencement of the CAS survey.

6.1.1.3 Upon receipt of such notification the RO shall:

.1 issue to the Company the Survey Planning Questionnaire (see Appendix 2) not later than 7 months prior to the planned commencement of the CAS survey; and

.2 advise the Company whether there have been any changes to the maximum acceptable structural corrosion diminution levels applicable to the ship.

6.1.1.4 The Company shall complete and return the Survey Planning Questionnaire to the RO not less than 5 months prior to the planned commencement of the CAS survey. A copy of the completed questionnaire shall be forwarded by the Company to the Administration.

6.1.1.5 The Survey Plan for the CAS shall be completed and submitted in signed order by the Company to the RO not less than 2 months prior to the planned commencement of the CAS survey. A copy of the Survey Plan for the CAS shall be forwarded by the Company to the Administration.

6.1.1.6 In special circumstances, such as re-activation from lay-up or unexpected events such as an extended stoppage period for hull or machinery damage, the Administration may, on a case by case basis, relax the time frame, outlined in 6.1.1.2 to 6.1.1.5, for commencement of CAS procedures.

6.1.1.7 Such relaxation shall, at all times, be subject to the RO having sufficient time to complete the CAS survey and issue the Interim Statement of Compliance under regulation 13G(6) or 13H(6)(a), or the Administration to review the CAS Final Report and issue the Statement of Compliance under regulation 13G(7), as applicable, prior to re-entry of the ship to service.**

6.1.2 Survey Plan for the CAS

6.1.2.1 The Survey Plan for the CAS shall be developed by the Company in cooperation with the RO. The Administration may participate in the development of the Survey Plan, if it deems necessary. The RO shall be fully satisfied that the Survey Plan complies with the requirements of 6.2.2 prior to the CAS survey being commenced. The CAS survey shall not commence unless and until the Survey Plan has been agreed.

6.1.2.2 The Survey Planning Questionnaire shall be drawn up based on the format set out in Appendix 2.

6.2 Survey Plan documentation

6.2.1 In developing the Survey Plan, the following documentation shall be collected and reviewed with a view to identifying tanks, areas and structural elements to be examined:

.1 basic ship information and survey status;

.2 main structural plans of cargo and ballast tanks (scantling drawings), including information regarding use of high tensile steels (HTS);

.3 Condition Evaluation Report, according to Annex 9 of Annex B of resolution A.744(18), as amended, and, where relevant, any previous CAS Final Reports;

.4 thickness measurement reports;

.5 relevant previous damage and repair history;

.6 relevant previous survey and inspection reports from both the RO and the Company;

.7 cargo and ballast history for the last 3 years, including carriage of cargo under heated conditions;

.8 details of the inert gas plant and tank cleaning procedures as indicated in the Survey Planning Questionnaire;

.9 information and other relevant data regarding conversion or modification of the ship's cargo and ballast tanks since the time of construction;

.10 description and history of the coating and corrosion protection system (including anodes and previous class notations), if any;

.11 inspections by the Company's personnel during the last 3 years with reference to:

.1 structural deterioration in general;

.2 leakages in tank boundaries and piping;

.3 condition of the coating and corrosion protection system (including anodes), if any;

.12 information regarding the relevant maintenance level during operation including:

.1 port State control reports of inspection containing hull related deficiencies;

.2 Safety Management System non-conformities relating to hull maintenance, including the associated corrective action(s); and

.13 any other information that will help identify Suspect Areas and Critical Structural Areas.

6.2.2 The Survey Plan shall include relevant information so as to enable the successful and efficient execution of the CAS survey and shall set out the requirements with respect to close-up surveys and thickness measurements. The Survey Plan shall include:

.1 basic ship information and particulars;

.2 main structural plans of cargo and ballast tanks (scantling drawings), including information regarding use of high tensile steels (HTS);

.3 arrangement of tanks;

.4 list of tanks with information on their use, extent of coatings and corrosion protection systems;

.5 conditions for survey (e.g. information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);

.6 provisions and methods for access to structures;

.7 equipment for surveys;

.8 identification of tanks and areas for the close-up survey;

.9 identification of tanks for tank testing, as per Annex 3 of Annex B of resolution A.744(18), as amended;

.10 identification of areas and sections for thickness measurement;

.11 identification of the Thickness Measurement (TM) firm;

.12 damage experience related to the ship in question; and

.13 Critical Structural Areas and Suspect Areas, where relevant.

6.2.3 The Survey Plan shall be developed using the Model Survey Plan for CAS set out in Appendix 3.***

6.3 Documentation on board

6.3.1 The Company shall ensure that, in addition to the agreed Survey Plan, all other documents used in the development of the Survey Plan referred to in 6.2.1 are available on board at the time of the CAS survey.

6.3.2 Prior to the commencement of any part of the CAS survey, the attending surveyor(s) shall examine and ascertain the completeness of the on board documentation and shall review its contents with a view to ensuring that the Survey Plan remains relevant.

6.4 Conduct of CAS Surveys

6.4.1 The conditions for CAS Survey, the conditions and method of access to the structures, the equipment for CAS Survey and the communication arrangements implemented during the CAS Survey shall meet the Mandatory Requirements for the Safe Conduct of CAS Surveys set out in Appendix 4.***

*** Incorporated from resolution MEPC.99(48)

7 CAS SURVEY REQUIREMENTS

7.1 General

7.1.1 Prior to the commencement of any part of the CAS survey a meeting shall be held between the attending surveyor(s), the Company's representative(s) in attendance, the TM Firm Operator (as applicable) and the master of the ship for the purpose of ascertaining that all the arrangements envisaged in the Survey Plan are in place, so as to ensure the safe and efficient execution of the survey work to be carried out.

7.1.2 The CAS survey shall be carried out by not less than two qualified exclusive surveyors of the RO. A qualified surveyor of the RO shall attend on board during the taking of the thickness measurements for the purpose of controlling the process.

7.1.3 The RO shall designate the surveyor(s) and any other personnel who will be engaged in the CAS of each vessel and shall keep records to this end. A qualified surveyor(s) shall have documented experience in carrying out intermediate or renewal surveys in accordance with the Enhanced Survey Programme of Inspection for tankers. In addition, all RO personnel to be assigned duties in connection with the CAS shall complete, prior to the assignment of such duties, an appropriate training and familiarization programme to enable the RO to ensure the consistent and uniform application of the CAS. The Administration shall require the RO to keep records of the qualifications and experience of the surveyors and of other personnel assigned to carry out work for the CAS. The Administration shall require the RO to monitor the performance of the personnel who have carried out or have been engaged in any CAS work and to keep records to this end.

7.1.4 When the CAS survey is split between survey stations, a list of the items examined and an indication of whether the CAS survey has been completed shall be made available to the attending surveyors at the next survey station prior to continuing the CAS survey.

7.1.5 Whenever the attending surveyors are of the opinion that repairs are required, each item to be repaired shall be identified in a numbered list. Whenever repairs are carried out, details of the repairs effected shall be reported by making specific reference to relevant items in the numbered list.

7.1.6 Whenever the attending surveyors are of the opinion that it is acceptable to defer hull repairs beyond the due date previously assigned, such a decision shall not be left to the sole discretion of the attending surveyors. The RO Headquarters shall be consulted in such circumstances and shall give specific approval to the recommended action.

7.1.7 The CAS survey is not complete unless all recommendations/conditions of class which relate to hull structures under review by the CAS survey have been rectified to the satisfaction of the RO.

7.2 Extent of overall and close-up surveys

7.2.1 Overall survey

An overall survey of all spaces set out in 5.2 shall be carried out at the CAS survey.

7.2.2 Close-up survey

The requirements for close-up surveys at the CAS survey are set out in the table below.

Table 7.2.2

Close up Survey Requirements
All web frame rings, in all ballast tanks (see note 1)
All web frame rings, in a cargo wing tank (see note 1)
A minimum of 30% of all web frame rings, in each remaining cargo wing tank (see note 1 and 3)
All transverse bulkheads, in all cargo and ballast tanks (see note 2)
A minimum of 30% of deck and bottom transverses including adjacent structural members, in each cargo center tank (see note 3)***
Additional complete transverse web frame rings or deck and bottom transverse including adjacent structural members as considered necessary by the attending surveyor

Notes:

1 Complete transverse web frame ring including adjacent structural members.

2 Complete transverse bulkhead, including girder and stiffener systems and adjacent members.

*3 The 30% shall be rounded up to the next whole integer.****

7.2.3 The attending surveyors may extend the scope of the close-up survey as considered necessary, taking into account the Survey Plan, the condition of the spaces under survey, the condition of the corrosion prevention system and also the following:

.1 any information that may be available on Critical Structural Areas;

.2 tanks which have structures with reduced scantlings in association with a corrosion prevention system approved by the RO.

7.2.4 For areas in tanks where coatings are found to be in GOOD condition, the extent of close-up surveys according to 7.2.2 may be specially considered by the RO. However, sufficient close-up surveys shall be carried out, in all cases, to confirm the actual average condition of the structure and to note the maximum observed diminution of the structure.

7.3 Extent of thickness measurements

7.3.1 The thickness measurements shall be recorded using the tables contained in Appendix 2 of Annex 10 of Annex B of resolution A.744(18), as amended. It is recommended that these records be kept in an electronic medium.

7.3.2 The thickness measurements shall be carried out either prior to or, to the maximum extent possible, concurrently with the close-up survey.

*** Incorporated from resolution MEPC.99(48)

7.3.3 The minimum requirements for thickness measurements for the CAS surveys shall be those set out in the table below:

Table 7.3.3

Thickness Measurements Requirements
1. Within the cargo area: .1 Each deck plate .2 Three transverse sections .3 Each bottom plate
2. Measurements of structural members subject to close-up survey according to 7.2.2, for general assessment and recording of corrosion pattern
3. Suspect areas
4. Selected wind and water strakes outside the cargo area.
5. All wind and water strakes within the cargo area.
6. Internal structure in the fore and aft peak tanks
7. All exposed main deck plates outside the cargo area and all exposed first tier superstructure deck plates

7.3.4 Where substantial corrosion is found, the extent of the thickness measurements shall be increased in accordance with Annex 4 of Annex B of resolution A.744(18), as amended.

7.3.5 In addition, the thickness measurements may be extended as considered necessary by the attending surveyors.

7.3.6 For areas in tanks where coatings are found to be in GOOD condition, the extent of thickness measurements, according to paragraph 7.3.3, may be specially considered by the RO. However, sufficient thickness measurements shall be taken, in all cases, to confirm the actual average condition and the maximum observed diminution of the structure.

7.3.7 The thickness measurement to be taken shall be sufficient to enable the reserve strength calculations in accordance with Annex 12 of Annex B of resolution A.744(18), as amended.

7.3.8 Transverse sections shall be chosen where the maximum diminutions are expected to occur or are revealed from deck plating thickness measurements. At least one transverse section shall include a ballast tank within 0.5L amidships.

8 ACCEPTANCE CRITERIA

The acceptance criteria for the CAS shall be those set out in resolution A.744(18), as amended.

9 CAS SURVEY REPORTS

9.1 A survey report shall be completed for the CAS survey. The report shall indicate the date, location (place), and where relevant, whether or not the CAS survey was carried out in dry-dock afloat or at sea. When the CAS survey is split between different survey stations, a report shall be made for each portion of the CAS survey.

9.2 Survey records relating to the CAS survey, including actions taken, shall form an auditable documentary trail, which shall be made available to the Administration, if requested.

9.3 In addition, the following shall be included in each CAS survey report:

.1 Extent of the Survey:

.1 identification of the spaces where an overall survey has been carried out;

.2 identification of location, in each space, where a close-up survey has been carried out, together with the means of access used; and

.3 identification of the spaces, and locations in each space, where thickness measurements have been carried out; and

.2 Results of the Survey:

.1 extent and condition of coating in each space. Identification of spaces fitted with anodes and the overall condition of the anodes;

.2 structural condition reporting for each space, which shall include information on the following, as applicable:

.1 corrosion (location and type of corrosion such as grooving, pitting, etc.);

.2 cracks (location, description and extent);

.3 buckling (location, description and extent);

.4 indents (location, description and extent); and

.5 areas of substantial corrosion; and

.3 Actions taken with respect to findings:

.1 details of repairs completed on structural members in identified spaces, including the repair method and extent; and

.2 list of items to be kept under observation for planning future inspections and surveys including any thickness measurements.

9.4 Where no defects are found, this shall be stated in the report for each space.

9.5 The narrative report shall be supplemented by photographs showing the general condition of each space, including representative photographs or sketches of any of the above reported items.

9.6 The thickness measurement report shall be verified and endorsed by the attending surveyor.

9.7 The attending surveyors shall sign the CAS survey report.

10 CAS FINAL REPORT TO THE ADMINISTRATION

10.1 Review of the CAS by the RO

10.1.1 The RO Headquarters shall carry out a verification review of the CAS survey reports, the documents, photographs and other records relating to the CAS, as specified in section 9, for the purpose of ascertaining and confirming that the requirements of the CAS have been met.

10.1.2 The RO reviewing personnel shall not be engaged in any way whatsoever with the CAS survey under review.

10.2 CAS Final Report to the Administration

10.2.1 The RO shall prepare a CAS Final Report to the Administration upon completion of the CAS survey and following the review of the CAS survey reports by the RO's Headquarters, as specified in paragraph 10.1.1.

10.2.2 The CAS Final Report shall be submitted by the RO to the Administration without delay and:

.1 in the case of the CAS survey in accordance with regulation 13G(6) or 13H(6)(a), not later than 3 months after the completion of the CAS survey; or**

.2 in the case of the CAS survey in accordance with regulation 13G(7), not later than 3 months after the completion of the CAS survey, or 2 months prior to the date the ship is required to be issued with a Statement of Compliance, whichever occurs earlier.**

10.2.3 The CAS Final Report shall, at least, include:

.1 the following general particulars:

Ship's name
IMO number
Flag State
Port of registry
Gross tonnage
Deadweight (metric tonnes)
Summer load line draught
Date of delivery
Category of ship
Date for compliance with regulation 13F
Company
Report identification reference

** Incorporated from resolution MEPC.112(50)

.2 a summary as to where, when, by whom and how the CAS survey was carried out;

.3 a statement identifying all survey documentation, including the Survey Plan;

.4 a statement as to the condition of the corrosion prevention system(s) applied to the spaces;

.5 a statement identifying all thickness measurement reports;

.6 a summary of the findings of the overall surveys;

.7 a summary of the findings of the close-up surveys;

.8 a summary of the hull repairs carried out;

.9 an identification, together with the location, the extent and the condition, of all areas with substantial corrosion;

.10 a summary of the results of the evaluation of the thickness measurements, including identification of the areas and sections where thickness measurements were carried out;

.11 an evaluation of the structural strength of the vessel and an assessment of compliance with the acceptance criteria set out in section 8;

.12 a statement as to whether all the applicable requirements of the CAS have been met;

.13 a recommendation to the Administration as to whether the ship should be allowed to continue operating until the date envisaged in regulation 13G for compliance with the requirements of regulation 13F or for the period of validity of the CAS, if earlier; and

.14 conclusions.

11 VERIFICATION OF THE CAS BY THE ADMINISTRATION

11.1 In addition to any instructions the Administration may have issued to the RO authorized to carry out surveys under the Enhance Survey Programme on its behalf, the Administration shall issue instructions to the RO and to Companies operating Category 2 and Category 3** oil tankers flying its flag, so that the Administration is able to monitor the performance of and verify compliance with the CAS.

11.2 The Administration, for the purpose of ensuring uniform and consistent implementation of the CAS, shall establish, at least, procedures through which it will:

** Incorporated from resolution MEPC.112(50)

.1 give effect to the requirements of the CAS;

.2 monitor the CAS work the RO is carrying out on its behalf;

.3 review the CAS Final Report;

.4 review cases of ships which have been submitted for the CAS re-assessment; and

.5 issue the Statement of Compliance.

11.3 The Administration shall review the CAS Final Report prior to the issue of the Statement of Compliance, shall record and document the findings and conclusions of the review and its decision as to the acceptance or rejection of the CAS Final Report and shall produce a Review Record.

11.4 The Administration shall ensure that any persons assigned to monitor the execution of the CAS or to review a CAS Final Report:

.1 are adequately qualified and experienced to the satisfaction of the Administration;

.2 are under the direct control of the Administration; and

.3 have no connection whatsoever with the RO which carried out the CAS survey under review.

12 RE-ASSESSMENT OF SHIPS FOLLOWING FAILURE TO MEET THE REQUIREMENTS OF THE CAS

12.1 A ship which, in the opinion of the Administration, has failed to meet the requirements of the CAS, may be submitted for the CAS re-assessment. In such a case the grounds on which Administration declined the issue of a Statement of Compliance to the ship shall be addressed and dealt with and the remedial actions shall, thereafter, be reviewed for the purpose of ascertaining whether the requirements of the CAS have been complied with.

12.2 Such re-assessment, as a rule, shall be carried out by the RO and by the Administration who carried out the previous CAS.

12.3 If a ship which has failed to obtain a Statement of Compliance changes flag, the new Administration shall, in accordance with the provisions of regulation 8(3), request the previous Administration to transmit to them copies of the CAS documentation relating to that ship for the purpose of ascertaining whether the grounds on the basis of which the previous Administration declined the issue to the ship of a Statement of Compliance are dealt with and that the CAS is implemented in a consistent and uniform manner.

12.4 As a rule, the CAS re-assessment shall be carried out as soon as possible and in any case, subject to the provisions of paragraph 5.3, not later than 6 months following the date on which the Administration has made the decision to decline the issue of a Statement of Compliance to the ship.

13 STATEMENT OF COMPLIANCE

13.1 The Administration shall, in accordance with its procedures, issue to each ship which completes the CAS to the satisfaction of the Administration, a Statement of Compliance.

Such Statement shall be issued:

.1 in the case of the CAS in accordance with regulation 13G(6) or 13H(6)(a), not later than 5 months after the completion of the CAS survey; or**

.2 in the case of the CAS in accordance with regulation 13G(7), not later than 5 months after the completion of the CAS survey, or the anniversary of the date of delivery of the ship in 2010, whichever occurs earlier, for the first CAS survey, and not later than the expiry date of Compliance for any subsequent CAS survey.**

13.2 The Statement of Compliance shall be drawn up in the official language of the issuing Administration in a form corresponding to the model given in Appendix 1. If the language used is neither English, French or Spanish, the text shall include a translation into one of these languages.

13.3 The original of the Statement of Compliance shall be placed on board the ship as a supplement to the ship's International Oil Pollution Prevention Certificate.

13.4 In addition, a copy of the CAS Final Report which was reviewed by the Administration for the issue of the Statement of Compliance and a copy of the Review Record, specified in paragraph 11.3, shall be placed on board to accompany the Statement of Compliance.

13.5 A certified copy of the Statement of Compliance and a copy of the Review Record, specified in paragraph 11.3, shall be forwarded by the Administration to the RO and shall be kept together with the CAS Final Report.

13.6 The validity of the Statement of Compliance shall not exceed 5 years and 6 months from the date of completion of the CAS survey.**

13.7 The RO which has carried out the CAS survey in accordance with regulation 13G(6) or 13H(6)(a), upon satisfactory completion of the survey, shall issue an Interim Statement of Compliance in a form corresponding the model given in appendix 1, for a period not exceeding 5 months. It shall remain valid until its expiry date or the date of issue of a Statement of Compliance, whichever is the earlier date, and shall be accepted by other Parties to MARPOL 73/78.**

13.8 The Administration may consider and declare that the Statement of Compliance of a ship remains valid and in full force and effect if:

.1 the ship is transferred to a RO other than the one that submitted the CAS Final Report that was reviewed and accepted for the issue of the Statement of Compliance; or

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** Incorporated from resolution MEPC.112(50)

.2 the ship is operated by a Company other than the one that was operating the ship at the time of the completion of the CAS survey;

provided the period of validity and the terms and conditions for the issue of the Statement of Compliance in question remain those adopted by the Administration at the time of the issue of the Statement of Compliance.

13.9 If a ship with a valid Statement of Compliance is transferred to the flag of another Party, the new Administration may issue to that ship a new Statement of Compliance on the basis of the Statement of Compliance issued by the previous Administration, provided that the new Administration:

.1 requests and receives from the previous Administration, in accordance with regulation 8(3), copies of all the CAS documentation relating to that ship which the previous Administration has used for the issue or renewal and the maintenance of the validity of the Statement of Compliance the ship was issued with at the time of the transfer;

.2 establishes that the RO which submitted the CAS Final Reports to the previous Administration is an RO authorised to act on its behalf;

.3 reviews the documentation referred to in subparagraph .1 and is satisfied that the requirements of the CAS are met; and

.4 limits the period and the terms and conditions of validity of the Statement of Compliance to be issued to those established by the previous Administration.

13.10 The Administration shall:

.1 suspend and/or withdraw the Statement of Compliance of a ship if it no longer complies with the requirements of the CAS; and

.2 withdraw the Statement of Compliance of a ship if it is no longer entitled to fly its flag.

14 COMMUNICATION OF INFORMATION TO THE ORGANIZATION

14.1 The Administration shall communicate to the Organization:

.1 particulars of the Statements of Compliance issued;

.2 details of the suspension or withdrawal of the Statements of Compliance issued; and

.3 particulars of the ships to which it has declined the issue of a Statement of Compliance and reasons thereof.

14.2 The Organization shall circulate the aforementioned information to all Parties to MARPOL 73/78 and shall maintain an electronic database containing the aforesaid information, accessible only to Parties to MARPOL 73/78.

Attachment 1

Appendix 1

FORM OF STATEMENT OF COMPLIANCE

STATEMENT OF COMPLIANCE

Issued under the provisions of the Condition Assessment Scheme (CAS) adopted by the Organization by resolution MEPC 94(46) as amended **under the authority of the Government of:

……
(full designation of the country)

Particulars of ship

Name of ship .....
Distinctive number or letters .....
Port of registry .....
Gross tonnage .....
Deadweight of ship (metric tons) .....
IMO number .....
Category of tanker .....

THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with the requirements of CAS (resolution MEPC 94(46) as amended);

2 That the survey showed that the structural condition of the ship is in all respects satisfactory and the ship complied with the requirements of the CAS.

Date of completion of the CAS survey: dd/mm/yyyy.**

This Statement of Compliance is valid until .....

Issued at .....
(Place of issue)

……. .....
(Date of issue) (*Signature of duly authorized official issuing the Statement)*

(Seal or stamp of the authority, as appropriate)

** Incorporated from resolution MEPC.112(50)

FORM OF INTERIM STATEMENT OF COMPLIANCE**

INTERIM STATEMENT OF COMPLIANCE

Issued under the provisions of the Condition Assessment Scheme (resolution MEPC 94(46) as amended) by:

……
(full name of the Recognized Organization)

Particulars of ship

Name of ship .....
Distinctive number or letters .....
Port of registry .....
Gross tonnage .....
Deadweight of ship (metric tons) .....
IMO number .....
Category of tanker .....

THIS IS TO CERTIFY:

1 That the ship has been surveyed in accordance with the requirements of CAS (resolution MEPC 94(46) as amended);

3 That the survey showed that the structural condition of the ship covered by CAS are in all respects satisfactory and the ship complies with the requirements of the CAS.

Date of completion of the CAS survey: dd/mm/yyyy.

This Statement is valid until ....., or the date of issue if the Statement of Compliance, whichever is the earlier date.

Issued at .....
(Place of issue of the Statement)

……. .....
(Date of issue) (*Signature of duly authorized official issuing the Statement)*

(Seal or stamp of the Recognized Organization, as appropriate)

** Incorporated from resolution MEPC.112(50)

Attachment 1

Appendix 2

SURVEY PLANNING QUESTIONNARE

Appendix 3

Model Survey Plan for CAS

Appendix 4

Mandatory Requirements for the Safe Conduct of CAS Surveys***

1 General

1.1 The present mandatory requirements have been developed for the safe conduct of CAS Surveys. Although the mandatory requirements make explicit reference to the CAS survey and to attending surveyor(s) it shall be used also in connection with any thickness measurement work required by the CAS.

2 Conditions for survey

2.1 The Company shall provide the necessary facilities for a safe conduct of the CAS survey.

2.2 In cases where the provisions of safety and required access are judged by the attending surveyors not to be adequate, the CAS survey of the spaces involved shall not proceed.

2.3 In order to enable the attending surveyors to carry out the CAS survey, provisions for proper and safe access, shall be agreed between Company and Recognized Organization.

2.4 Details of the means of access are provided in the Survey Planning Questionnaire.

2.5 Tanks and spaces shall be safe for access.* Tanks and spaces shall be gas free and shall be ventilated. Prior to entering a tank, void or enclosed space, it shall be verified that the atmosphere in the tank is free from hazardous gas and contains sufficient oxygen.

2.6 Tanks and spaces shall be sufficiently clean and free from water, scale, dirt, oil residues, corrosion scale, sediments etc., to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.

2.7 Sufficient illumination shall be provided to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.

2.8 Where soft coatings have been applied, safe access shall be provided for the attending surveyor(s) to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures, which may include spot removal of the coating. Where the presence of soft coating inhibits safe access, the soft coating shall be removed.

2.9 The attending surveyor(s) shall always be accompanied by at least one responsible person assigned by the Company experienced in tank and enclosed spaces inspection. In addition a backup team of at least two experienced persons shall be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team shall continuously observe the work in the tank or space and shall keep lifesaving and evacuation equipment ready for use.

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* Reference is made to chapter 10 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT) - Entry into and working in enclosed spaces.

*** Incorporated from Resolution MEPC.99(48)

3 Access to structures

3.1 For overall survey, means shall be provided to enable the attending surveyors to examine the structure in a safe and practical way.

3.2 For close-up survey, one or more of the following means for access, acceptable to the attending surveyors, shall be provided:

- permanent staging and passages through structures
- temporary staging and passages through structures
- lifts and moveable platforms
- rafts or boats
- other equivalent means.

3.3 Surveys of tanks or spaces by means of rafts or boats may only be undertaken with the agreement of the attending surveyors, who shall take into account the safety arrangements provided, including weather forecasting and ship response in reasonable sea conditions.

3.4 When rafts or boats will be used for close-up survey the following conditions shall be observed:

.1 Only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, shall be used;

.2 The boat or raft shall be tethered to the access ladder and an additional person shall be stationed down the access ladder with a clear view of the boat or raft;

.3 Appropriate lifejackets shall be available for all participants;

.4 The surface of water in the tank shall be calm (under all foreseeable conditions the expected rise of water within the tank shall not exceed 0.25 m) and the water level either stationary or falling. On no account shall the level of the water be rising while the boat or raft is in use;

.5 The tank or space must contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable;

.6 At no time shall the water level be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses shall only be contemplated if a deck access manhole is fitted and open in the bay being examined, so that an escape route for the survey party is available at all times;

7 If the tanks (or spaces) are connected by a common venting system, or Inert Gas system, the tank in which the boat or raft is to be used shall be isolated to prevent a transfer of gas from other tanks (or spaces).

3.5 In addition to the above rafts or boats alone may be allowed for inspection of the under deck areas for tanks or spaces, if the depth of the webs are 1.5 m or less.

3.6 If the depth of the webs is more than 1.5 m, rafts or boats alone may be allowed only:

.1 when the coating of the under deck structure is in GOOD condition and there no evidence of wastage; or

.2 if a permanent means of access is provided in each bay to allow safe entry and exit. This means of access is to be direct from the deck via a vertical ladder and a small platform shall be fitted approximately 2 m below the deck.

If neither of the above conditions are met then staging shall be provided for the survey of the under deck area.

4 Equipment for survey

4.1 Thickness measurement shall normally be carried out by means of ultrasonic test equipment. The accuracy of the equipment shall be proven to the attending surveyor(s) as required.

4.2 One or more of the following fracture detection procedures may be required if deemed necessary by the attending surveyor(s):

- radiographic equipment
- ultrasonic equipment
- magnetic particle equipment
- dye penetrant
- other equivalent means

4.3 Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles together with instructions and guidance on their use shall be made available during the CAS survey. A safety checklist shall be provided.

4.4 Adequate and safe lighting shall be provided for the safe and efficient conduct of the CAS survey.

4.5 Adequate protective clothing shall be made available and used (e.g. safety helmet, gloves, safety shoes, etc) during the CAS survey.

5 Meetings and Communication Arrangements

5.1 The establishment of proper preparation and the close co-operation between the attending surveyors and the Company's representatives on board prior to and during the CAS survey are an essential part in the safe and efficient conduct of the CAS survey. During the CAS survey on board safety meetings shall be held regularly.

5.2 Prior to commencement of the CAS survey a survey meeting shall be held between the attending surveyors the Company's representative(s) in attendance, the TM Firm Operator (as applicable) and the Master of the ship for the purpose to ascertain that all the arrangements envisaged in the Survey Plan are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out.

5.3 The following is an indicative list of items that shall be addressed in the meeting:

.1 schedule of the vessel (i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.);

.2 provisions and arrangements for thickness measurements (i.e. access, cleaning/de-scaling, illumination, ventilation, personal safety);

.3 extent of the thickness measurements;

.4 acceptance criteria (refer to the list of minimum thicknesses);

.5 extent of close-up survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion;

.6 execution of thickness measurements;

.7 taking representative readings in general and where uneven corrosion/pitting is found;

.8 mapping of areas of substantial corrosion;

.9 communication between attending surveyor(s) the TM operator(s) and Company representative(s) concerning findings.

5.4 A communication system shall be arranged between the survey party in the tank or space being examined, the responsible officer on deck and, as the case may be, the navigation bridge. This system shall also include the personnel in charge of handling the ballast pump(s) if rafts or boats are used. The communication arrangements shall be maintained throughout the CAS survey.

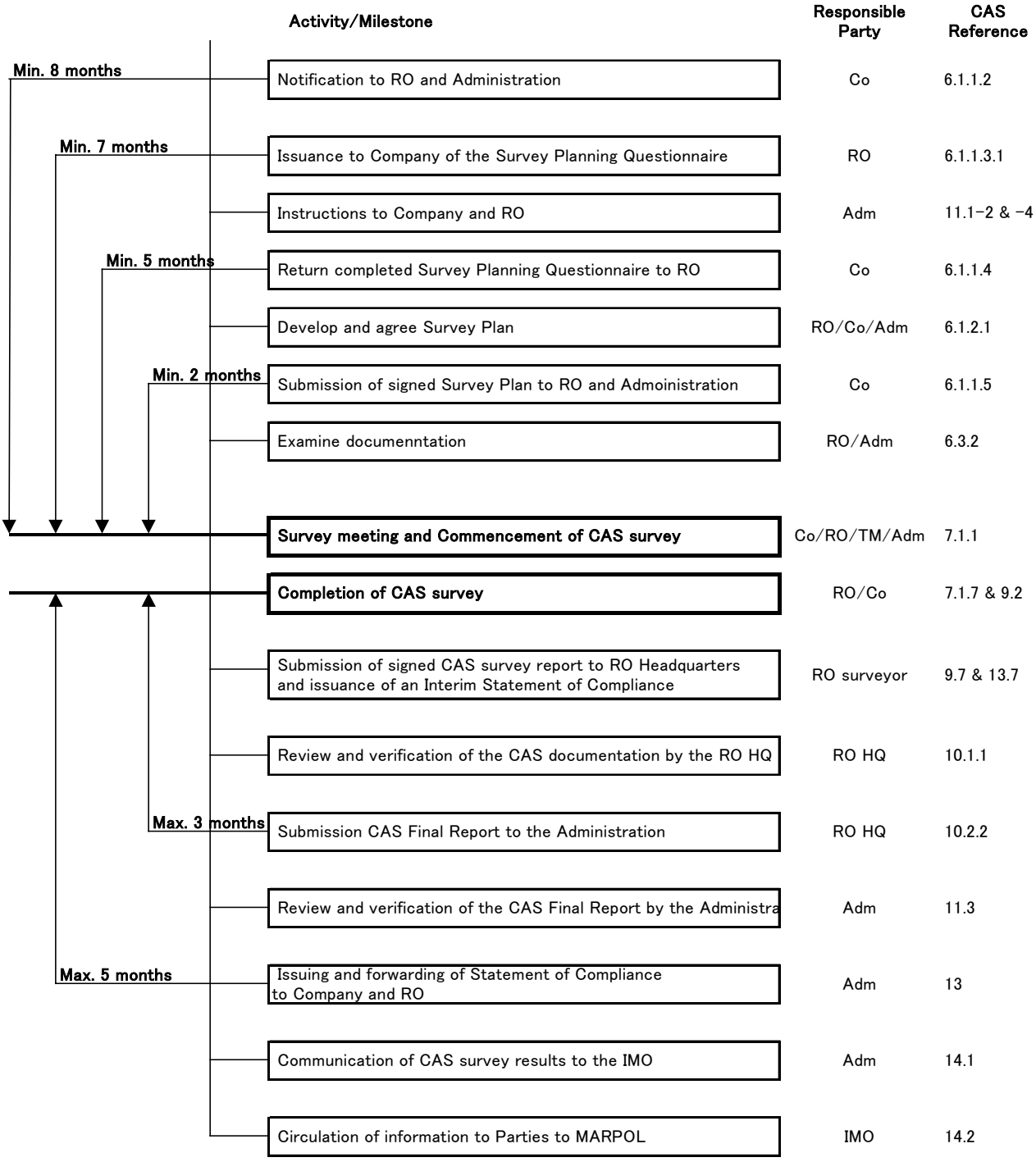
***

Attachment 1

Appendix 5

CAS Schedule*

For the sole purpose of aid to the Companies and Recognized Organizations in the preparation of the CAS Survey and shall be read and used for this purpose only.



* Incorporated from MEPC/Circ.390 and Resolution MEPC.112(50)

Attachment 2

ClassNK

SURVEY PLANNING QUESTIONNAIRE

The following information will enable the Company in co-operation with the RO to develop a Survey Plan complying with the requirements of the CAS.

It is essential that the Company provides, when completing the present questionnaire, up-to-date information.

The present questionnaire, when completed, shall provide all information and material required by the CAS.

Particulars

Ship's name:
IMO number:
Flag State:
Port of registry:
Gross tonnage:
Deadweight (metric tonnes):
Summer load line draught:
Date of delivery:
Category of ship:
Date for compliance with regulation 13F:
Company:
Report identification reference:

Information on access provision for close-up surveys and thickness measurement:

The Company is requested to indicate, in the table below, the means of access to the structures subject to close-up survey and thickness measurement.

A *Close-up survey* is an examination where the details of structural components are within the close visual inspection range of the attending surveyor, i.e. preferably within reach of hand.

Space		Temporary Staging	Rafts	Ladders	Direct Access	Other means (please specify)
Fore Peak						
Wing Tanks	Under deck					
	Side shell					
	Bottom transverse					
	Longitudinal					
	Transverse					
Centre Tanks	Under deck					
	Bottom transverse					
	Transverse					

Attachment 2

Tank Cleaning Procedures:		
Indicate the frequency of the tank washing especially in way of uncoated tanks :		
Washing medium used:	Crude oil	: Yes/No
	Heated seawater	: Yes/No
	Other medium (specify)	:

Inert Gas System installed: Yes/No
Indicate average oxygen content during inerting:
Details of use of the inert case plant:

Cargo history for the last 3 years together with indication as to whether cargo was heated

Ballast history for the last 3 years

Attachment 2

Inspections by the Company

Using a format similar to that of the table below (which is given as an example), the Company should provide details of the results of their inspections, for the last 3 years - in accordance with the requirements of resolution A.744(18), as amended, and of the CAS - on all CARGO and BALLAST tanks and VOID spaces within the cargo area.

Spaces (include frame numbers and p or s)	Corrosion protection (1)	Coating Extent (2)	Coating Condition (3)	Structural deterioration (4)	Tank History (5)
Cargo Centre Tanks					
Cargo Wing Tanks					
Slop					
Ballast tanks					
Aft peak					
Fore peak					
Miscellaneous spaces:					

* Indicate tanks which are used for oil/ballast

1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection
2) U=upper part; M=middle part; L=lower part; C=complete
3) G=good; F=fair; P=poor, RC=recoated
4) N= no findings recorded
   Y= findings recorded, description of findings is to be attached to the questionnaire
5) D R= Damage & Repair
   L= Leakages
   CV= Conversion
   CPS= Corrosion protection system
   (reports to be attached)

Company: .....

Name/Signature: .....

Date: .....

Attachment 2

Reports of port State control inspections

List the reports of port State control of inspection containing hull related deficiencies and relevant information on the deficiencies:

Safety Management System

List non-conformities related to hull maintenance, including the associated corrective actions:

Name of the Thickness Measurement (TM) firm

***

ClassNK

CONDITION ASSESSMENT SCHEME (CAS)
SURVEY PLAN

Basic Information and Particulars

Name of Ship	:	
IMO Number	:	
Flag State	:	
Port of Registry	:	
Gross Tonnage (ton)	:	
Deadweight (metric tinnes)	:	
Lpp x B x D (m)	:	
Summer load line draught (m)	:	
Builder and Hull number	:	
Recognised Organisation (RO) RO Identity	:	Nippon Kaiji Kyokai NK
Class Notaion	:	
Date of delivery	:	
Category of Ship (2 or 3)	:	Category
Date of compliance with Regulation 13F	:	
Company	:	
Thickness Measurement Firm	:	

Prepared on behalf of the Company by

Date :

_____

(name and signature of authorised representative)

Reviewed by the Recognized Organization (NIPPON KAIJI KYOKAI) for compliance with paragraph 6.2.2 of the CAS.

Date :

_____

(T. Matsui)
General Manager of Survey Department

1 Preamble

1.1 Scope

1.1.1 The present CAS Survey Plan covers the minimum extent of overall surveys, close-up surveys, thickness measurements and pressure testing within the cargo area, ballast tanks, including fore and aft peak tanks, required by the CAS adopted by resolution MEPC.94(46) as amended for this ship.

1.1.2 The practical aspects of any part of the CAS survey should be acceptable to the attending surveyor(s).

1.2 Documentation

All documents used in the development of the CAS survey plan shall be available onboard during the CAS survey as required by paragraph 6.3.1 of the CAS.

2 Arrangement of Tanks

This section of the Plan shall provide information (either in the form of plans or text) on the arrangement of tanks that fall within the scope of the CAS survey.

3. List of tanks with information on their use, extent of coatings and corrosion protection system

This section of the Plan shall indicate any changes relating to (and should update) the information on the use of the tanks of the ship, the extent of coatings and the corrosion protective system provided in the Survey Planning Questionnaire.

Spaces	Fr. No	Corrosion protection (1)	Coating Extent (2)	Coating Condition (3)

1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection

2) U=upper part; M=middle part; L=lower part; C=complete

3) G=good; F=fair; P=poor, RC=recoated

4 Conditions for survey (e.g. information regarding tank cleaning, gas freeing, ventilation, lighting etc.)

This section of the Plan shall indicate any changes relating to (and should update) the information on the conditions for survey provided in the Survey Planning Questionnaire.

- The Company should provide the necessary facilities for a safe conduct of the CAS survey.
- In cases where the provisions of safety and required access are judged by the attending surveyor(s) not to be adequate, the CAS survey of the spaces involved should not proceed.
- Tanks and spaces should be safe for access*. Tanks and spaces should be gas free and should be ventilated. Prior to entering a tank, void or enclosed space, it should be verified that the atmosphere in the tank is free from hazardous gas and contains sufficient oxygen.
- Tanks and spaces should be sufficiently clean and free from water, scale, dirt, oil residues, corrosion scale, sediments etc., to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating. In particular

this applies to areas that are subject to thickness measurement.

- Sufficient illumination should be provided to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.
- The attending surveyor(s) should always be accompanied by at least one responsible person assigned by the Company experienced in tank and enclosed spaces inspection. In addition a backup team of at least two experienced persons should be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team should continuously observe the work in the tank or space and should keep lifesaving and evacuation equipment ready for use.

* : Reference is made to chapter 10 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT) - Entry into and working in enclosed spaces.

Tank Cleaning Procedures

Indicate the frequency of the tank washing, especially uncoated tanks:

-
-

Washing medium used :

- Crude oil :
- Heated seawater :
- Other medium (specify) : cold seawater

Inert Gas System installed: Yes / No

Indicate average oxygen content during inerting:

5 Provisions and method of access to structures

This section of the Plan shall indicate any changes relating to (and shall update) the information on the provisions and methods of access to structures provided in the Survey Planning Questionnaire.

The mandatory Requirements for the Safe Conduct of CAS Surveys are contained in Appendix 3 to this Plan.

Space		Temporary Staging	Rafts	Ladders	Direct Access	Other means (to be specified)
Fore Peak Tank						
Wing Tanks	Under deck					
	Side shell					
	Bottom transverse					
	Longitudinal					
	Transverse					
Center Tanks	Under deck					
	Bottom transverse					
	Transverse					
Aft Peak Tank						

6 List of equipment for survey *(to be provided by the Company and supplemented by the Recognised Organisation, as necessary)*

This section of the Plan shall identify and list the equipment that will be made available for carrying out the CAS survey and the required thickness measurements.

The following safety equipment are available on board.

a) O_2 content meter / Type : _____
Accuracy to be checked by : _____
b) Gas detector / Type : _____
Accuracy to be checked by : _____
c) Portable Safety Light / No.: _____ sets of _____ type
d) Available breathing apparatus: _____ sets of _____ type
e) Are the safety goods also available at repair yard ? Yes / No

f) Other safety equipment, if any: _____
_____
_____
_____

7 Survey requirements

7.1 Overall survey

(The CAS requirements)

Paragraph 7.2.1 (and 5.2) of the CAS require that the hull structures in way of cargo tanks, pump rooms, cofferdams, pipe tunnels, voild spaces within the cargo area and all ballast tanks shall undergo an overall survey.

(The Plan)

This section of the Plan shall identify and list the spaces that should undergo an overall survey for this ship.

Space	Frame Number

7.2 Close up survey

(The CAS requirements)

Paragraph 7.2.2 (and Table 7.2.2) of the CAS state the hull structures that shall undergo a close up survey. These are:

Close up survey requirements
All web frame rings, in all ballast tanks (see note 1)
All web frame rings, in a cargo wing tank, (see note 1)
A minimum of 30% of all web frame rings, in each remaining cargo wing tank (see notes 1 and 3)
All transverse bulkheads, in all cargo and ballast tanks (see note 2)
A minimum of 30 % of the deck and bottom transverses, including adjacent structural members, in each cargo center tank (see note 3)
Additional complete transverse web frame rings or deck and bottom transverse including adjacent structural members as considered necessary by the surveyor

Notes:

1 Complete transverse web frame ring including adjacent structural member.

2 Complete transverse bulkhead, including girder and stiffener systems and adjacent members

3 The 30% should be rounded up to the next whole integer.

In addition paragraph 7.2.3 and 7.2.4 of the CAS provide further guidance as far as the extent and scope of the close up survey.

(The Plan)

This section of the Plan shall identify and list, using paragraph 7.2.2 (and Table 7.2.2) of the CAS, the hull structures that shall undergo a close up survey for this ship. In particular it should:

.1 identify the cargo wing tank in which all web frame rings will undergo close up survey and indicate the number of web frame rings involved;

.2 identify the remaining cargo wing tanks in which a minimum of 30% of the web frame rings will undergo a close up survey and indicate, for each tank, the number of web frame rings involved; and

.3 identify the cargo centre tanks in which a minimum of 30% of the deck and bottom transverses, including adjacent structural members, in each cargo center tank will undergo close up survey and indicate, for each tank, the number of the deck and bottom transverses, including adjacent structural members involved.

8 Identifications of tanks for tank testing

(The CAS requirements)

Paragraph 6.2.2.9 of the CAS states that the tank testing shall be as per annex 3 of Annex B of resolution A.744(18) as amended.

(The Plan)

This section of the Plan shall identify and list the tanks that should undergo tank testing for this ship.

9 Identification of areas and sections for thickness measurements

(The CAS requirements)

Paragraph 7.3.3 (and Table 7.3.3) of the CAS specify the minimum requirements for thisckness measurements for CAS survey. These are as follows.

Thickness measurement requirements	
1.	Within the cargo area: .1 Each deck plate .2 Three transverse sections .3 Each bottom plate
2.	Measurements of structural members subject to close-up survey according to the table above (for close up survey), for general assessment and recording of corrosion pattern
3.	Suspect areas
4.	Selected wind and water strakes outside the cargo area.
5.	All wind and water strakes within the cargo area.
6.	Internal structure in the fore and aft peak tanks
7.	All exposed main deck plates outside the cargo area and all exposed first tier superstructure deck plates

Guidance Notes:

1 The attending surveyor may increase the extent of thickness measurements as deemed necessary (see paragraph 7.3.5 of the CAS).

2 Transverse sections for thickness measurements should be chosen where the largest material reductions are expected to occur or are revealed from deck plating measurements (see section 7.3.8 of the CAS).

3 Where substantial corrosion is found, the extent of thickness measurements should be increased accordingly (see paragraph 7.3.4 of the CAS).

In addition paragraphs 7.3.4 to 7.3.8 of the CAS provide further guidance on the extent and increase of the thickness measurements to be taken.

(The Plan)

This section of the Plan shall identify and list, using paragraph 7.3.3 (and Table 7.3.3) of the CAS, the areas and sections where thickness measurements shall be taken.

See, Appendix 5 – Thickness Measurement Plan

10 **Hull Materials** (to be specified by the Recognised Organisation)

This section of the Plan shall identify, using a format similar to that of the table below, the materials used in the hull structures that fall within the scope of the CAS for the purpose of providing a concise reference.

Location	Plating	Longitudinals and Stiffeners	Longitudinal Girders / Stringers	Transverse Girders / Web Frames / Stringers / Floors
Deck				
Bottom				
Inner bottom				
Side shell				
Longitudinal bulkhead				
Transverse bulkheads				
Horizontal Girder				
Fore Peak				
Aft Peak				

Guidance Notes:

1 Material grade is Mild Steel (MS) where not shown otherwise.

2 Material grade HTS indicates High Tensile Steel; SS indicates Stainless Steel; and CS indicates Clad Steel.

3 In case of repairs material, grade, type and the extent should be verified from drawings.

11 **Minimum thickness of hull structures** (to be specified by the Recognised Organisation)

This section of the Plan shall specify the minimum thickness for hull structures of this ship that are subject to the CAS (indicate either (a) or preferably (b), if such information are available):*

(a) ☒ Determined from the attached* wastage allowance table and the original thickness according to the hull structure plans of the ship;

(b) ☐ Given in the following table(s)

**: The wastage allowance tables should be attached to the CAS Survey Plan.*

See, Appendix 5 – The Wastage Allowance

12 Thickness Measurement (TM) Firm

This section of the Plan shall identify changes, if any, relating to the information on the Thickness Measurement (TM) Firm provided in the Survey Planning Questionnaire.

13 Damage experience related to the ship

This section of the Plan shall, using the tables provided below, provide details of the hull damages for at least the last three (3) years in way of the cargo and ballast tanks areas and void spaces within the cargo area. These damages are subject to CAS survey.

Hull damages sorted by location for this ship

(to be provided by the Company and supplemented by the Recognised Organisation, as necessary)

Tank Number or Area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

Hull damages for sister or similar ships (if available) in the case of design related damage

(to be provided by the Company and supplemented by the Recognised Organisation, as necessary)

Tank Number or Area	Possible cause, if known	Description of the damages	Location	Repair	Date of repair

14 Areas identified with substantial corrosion from previous surveys *(to be provided by the Recognised Organisation)*

This section of the Plan shall identify and list the areas of substantial corrosion from previous surveys.

15 Critical structural areas and suspect areas *(to be provided by Company and supplemented by the Recognised Organisation, as necessary)*

This section of the Plan shall identify and list the critical structural areas and the suspect areas, when such information is available.

16 Other relevant comments and information *(to be provided by the Company and supplemented by the Recognised Organisation)*

This section of the Plan shall provide any other relevant, to the CAS survey, comments and information.

Appendices

Appendix 1 - List of Plans

Paragraph 6.2.2.2 of CAS requires that main structural plans of cargo and ballast tanks (scantling drawings), including information on regarding use of high tensile steel (HTS) to be provided.

This Appendix of the Plan shall identify and list the main structural plans which form part of the Plan and which are attached to the Plan.

Appendix 2 - Survey Planning Questionnaire

The Survey Planning Questionnaire, which has been submitted by the Company, should be appended to the Plan.

Appendix 3 – Mandatory Requirements for the Safe Conduct of CAS Surveys

The Mandatory Requirements for the Safe Conduct of CAS Surveys, which is contained in Appendix 4 of resolution MEPC.94(46) as amended by resolution MEPC.99(48) shall be appended to the Plan.

Appendix 4 - CAS Schedule

The CAS Schedule, which is contained in Annex 3 to MEPC/Circ.390 shall be appended to the Plan.*

Appendix 5 - Other documentation

This part of the Plan shall identify and list any other documentation that forms part of the Plan.

-1. **The Wastage Allowance**, as referred to Paragraph 11 "Minimum thickness of hull structures" is attached to this CAS Survey Plan.

-2. **Thickness Measurement Plan**, as referred to Paragraph 9 "Identification of areas and sections for thickness measurements" is attached to this CAS Survey Plan.

** The CAS Schedule is contained in annex 3 to MEPC/Circ.390. The sole purpose of the CAS Schedule is to aid Conpanies and Recognized Organization in the preparation of CAS Survey and shall be read used for this purpose only.*

Appendix 1 – List of Plans

1. **Basic ship information and particulars;**
   See, attached survey status

2. **Main structural plans of cargo and ballast tanks (scantling drawings), including information regarding use of high tensile steels (HTS);**
   - Midship Section and Typical Trans. BHD
   - Construction Profile & Decks
   - Shell Expansion (Fore & Aft)
   - Trans. and Bhd in Tank End
   - Forward Construction
   - Afterward Construction

3. **Arrangements of Tanks;**
   - General Arrangement

4. **List of tanks with information on their use, extent of coatings and corrosion protection systems;**
   - Coating specification

5. **Conditions for survey (e.g. information regarding tank cleaning, gas freeing, ventilation, lighting, etc.);**
   See, paragraph 4 of CAS SURVEY PLAN.

6. **Provisions and methods for access to structures;**
   See, paragraph 5 of CAS SURVEY PLAN.

7. **Equipment for survey;**
   See, paragraph 6 of CAS SURVEY PLAN.

8. **Identification of tanks and areas for the close-up survey;**
   See, paragraph 7.2 of CAS SURVEY PLAN.

9. **Identification of tanks for tank testing, as per Annex 3 of Annex B of resolution A.774(18) as amended;**
   See, paragraph 8 of CAS SURVEY PLAN and General Arrangement.

10. **Identification of areas and sections for thickness measurement;**
    See, paragraph 9 of CAS SURVEY PLAN.

11. **Identification of the Thickness Measurement (TM) firm;**
    See, paragraph 12 of CAS SURVEY PLAN.

12. **Damage experience related to the ship in question; and**
    See, paragraph 13 of CAS SURVEY PLAN.

13. **Critical Structural and Suspect Areas, where relevant.**
    See, paragraph 15 of CAS SURVEY PLAN.

Appendix 2 - Survey Planning Questionnaire

The following information will enable the Company in co-operation with the RO to develop a Survey Plan complying with the requirements of the CAS.

It is essential that the Company provides, when completing the present questionnaire, up-to-date information.

The present questionnaire, when completed, shall provide all information and material required by the CAS.

Particulars

Ship's name:
IMO number:
Flag State:
Port of registry:
Gross tonnage:
Deadweight (metric tonnes):
Summer load line draught:
Date of delivery:
Category of ship:
Date for compliance with regulation 13F:
Company:
Report identification reference:

Information on access provision for close-up surveys and thickness measurement:

The Company is requested to indicate, in the table below, the means of access to the structures subject to close-up survey and thickness measurement.

A *Close-up survey* is an examination where the details of structural components are within the close visual inspection range of the attending surveyor, i.e. preferably within reach of hand.

Space		Temporary Staging	Rafts	Ladders	Direct Access	Other means (please specify)
Fore Peak						
Wing Tanks	Under deck					
	Side shell					
	Bottom transverse					
	Longitudinal					
	Transverse					
Centre Tanks	Under deck					
	Bottom transverse					
	Transverse					

Tank Cleaning Procedures:		
Indicate the frequency of the tank washing especially in way of uncoated tanks :		
Washing medium used:	Crude oil	: Yes/No
	Heated seawater	: Yes/No
	Other medium (specify)	:

Inert Gas System installed: Yes/No
Indicate average oxygen content during inerting:
Details of use of the inert case plant:

Cargo history for the last 3 years together with indication as to whether cargo was heated

Ballast history for the last 3 years

Inspections by the Company

Using a format similar to that of the table below (which is given as an example), the Company should provide details of the results of their inspections, for the last 3 years - in accordance with the requirements of resolution A.744(18), as amended, and of the CAS - on all CARGO and BALLAST tanks and VOID spaces within the cargo area.

Spaces (include frame numbers and p or s)	Corrosion protection (1)	Coating Extent (2)	Coating Condition (3)	Structural deterioration (4)	Tank History (5)
Cargo Centre Tanks					
Cargo Wing Tanks					
Slop					
Ballast tanks					
Aft peak					
Fore peak					
Miscellaneous spaces:					

* Indicate tanks which are used for oil/ballast

1) HC=hard coating; SC=soft coating; A=anodes; NP=no protection
2) U=upper part; M=middle part; L=lower part; C=complete
3) G=good; F=fair; P=poor, RC=recoated
4) N= no findings recorded
   Y= findings recorded, description of findings is to be attached to the questionnaire
5) D R= Damage & Repair
   L= Leakages
   CV= Conversion
   CPS= Corrosion protection system
   (reports to be attached)

Company: .....

Name/Signature: .....

Date: .....

Reports of port State control inspections

List the reports of port State control of inspection containing hull related deficiencies and relevant information on the deficiencies:

Safety Management System

List non-conformities related to hull maintenance, including the associated corrective actions:

Name of the Thickness Measurement (TM) firm

***

Appendix 3

Mandatory Requirements for the Safe Conduct of CAS Surveys

1 General

1.1 The present Guidance Note has been developed for the safe conduct of CAS Surveys. Although this Guidance Note makes explicit reference to the CAS survey and to attending surveyor(s) it should be used also in connection with any thickness measurement work required by the CAS.

2 Conditions for survey

2.1 The Company should provide the necessary facilities for a safe conduct of the CAS survey.

2.2 In cases where the provisions of safety and required access are judged by the attending surveyor(s) not to be adequate, the CAS survey of the spaces involved should not proceed.

2.3 In order to enable the attending surveyor(s) to carry out the CAS survey, provisions for proper and safe access should be agreed between Company and Recognised Organisation.

2.4 Details of the means of access are provided in the Survey Planning Questionnaire.

2.5 Tanks and spaces should be safe for access*. Tanks and spaces should be gas free and should be ventilated. Prior to entering a tank, void or enclosed space, it should be verified that the atmosphere in the tank is free from hazardous gas and contains sufficient oxygen.

2.6 Tanks and spaces should be sufficiently clean and free from water, scale, dirt, oil residues, corrosion scale, sediments etc., to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating. In particular this applies to areas that are subject to thickness measurement.

2.7 Sufficient illumination should be provided to reveal significant corrosion, deformation, fractures, damages or other structural deterioration as well as the condition of the coating.

2.8 Where soft coatings have been applied, safe access should be provided for the attending surveyor(s) to verify the effectiveness of the coating and to carry out an assessment of the conditions of internal structures, which may include spot removal of the coating. When safe access cannot be provided, the soft coating should be removed.

2.9 The attending surveyor(s) should always be accompanied by at least one responsible person assigned by the Company experienced in tank and enclosed spaces inspection. In addition a backup team of at least two experienced persons should be stationed at the hatch opening of the tank or space that is being surveyed. The back-up team should continuously observe the work in the tank or space and should keep lifesaving and evacuation equipment ready for use.

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* : Reference is made to chapter 10 of the International Safety Guide for Oil Tankers and Terminals (ISGOTT) - Entry into and working in enclosed spaces.

3 Access to structures

3.1 For overall survey, means should be provided to enable the attending surveyor(s) to examine the structure in a safe and practical way.

3.2 For close-up survey, one or more of the following means for access, acceptable to the attending surveyor(s), should be provided:

- permanent staging and passages through structures
- temporary staging and passages through structures
- lifts and moveable platforms
- rafts or boats
- other equivalent means.

3.3 Surveys of tanks or spaces by means of rafts or boats may only be undertaken with the agreement of the attending surveyor(s), who should take into account the safety arrangements provided, including weather forecasting and ship response in reasonable sea conditions.

3.4 When rafts or boats will be used for close up survey the following conditions should be observed:

.1 Only rough duty, inflatable rafts or boats, having satisfactory residual buoyancy and stability even if one chamber is ruptured, should be used;

.2 The boat or raft should be tethered to the access ladder and an additional person should be stationed down the access ladder with a clear view of the boat or raft;

.3 Appropriate lifejackets should be available for all participants;

.4 The surface of water in the tank should be calm (under all foreseeable conditions the expected rise of water within the tank should not exceed 0.25 m) and the water level either stationary or falling. On no account should the level of the water be rising while the boat or raft is in use;

.5 The tank or space must contain clean ballast water only. Even a thin sheen of oil on the water is not acceptable;

.6 At no time should the water level be allowed to be within 1 m of the deepest under deck web face flat so that the survey team is not isolated from a direct escape route to the tank hatch. Filling to levels above the deck transverses should only be contemplated if a deck access manhole is fitted and open in the bay being examined, so that an escape route for the survey party is available at all times;

.7 If the tanks (or spaces) are connected by a common venting system, or Inert Gas system, the tank in which the boat or raft is to be used should be isolated to prevent a transfer of gas from other tanks (or spaces).

3.5 In addition to the above rafts or boats alone may be allowed for inspection of the under deck areas for tanks or spaces, if the depth of the webs are 1.5 m or less.

3.6 If the depth of the webs is more than 1.5 m, rafts or boats alone may be allowed only:

.1 when the coating of the under deck structure is in GOOD condition and there is no evidence of wastage; or

.2 if a permanent means of access is provided in each bay to allow safe entry and exit. This means of access is to be direct from the deck via a vertical ladder and a small platform should be fitted approximately 2 m below the deck.

If neither of the above conditions are met then staging should be provided for the survey of the under deck area.

4 Equipment for survey

4.1 Thickness measurement should normally be carried out by means of ultrasonic test equipment. The accuracy of the equipment should be proven to the attending surveyor(s) as required.

4.2 One or more of the following fracture detection procedures may be required if deemed necessary by the attending surveyor(s):

- radiographic equipment
- ultrasonic equipment
- magnetic particle equipment
- dye penetrant
- other equivalent means.

4.3 Explosimeter, oxygen-meter, breathing apparatus, lifelines, riding belts with rope and hook and whistles together with instructions and guidance on their use should be made available during the CAS survey. A safety check-list should be provided.

4.4 Adequate and safe lighting should be provided for the safe and efficient conduct of the CAS survey.

4.5 Adequate protective clothing should be made available and used (e.g. safety helmet, gloves, safety shoes, etc) during the CAS survey.

5 Meetings and Communication Arrangements

5.1 The establishment of proper preparation and the close co-operation between the attending surveyor(s) and the Company.s representatives onboard prior to and during the CAS survey are an essential part in the safe and efficient conduct of the CAS survey. During the CAS survey on board safety meetings should be held regularly.

5.2 Prior to commencement of the CAS survey a survey meeting should be held between the attending surveyor(s), the Company.s representative(s) in attendance, the TM Firm Operator (as applicable) and the Master of the ship for the purpose to ascertain that all the arrangements envisaged in the Survey Plan are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out.

5.3 The following is an indicative list of items that should be addressed in the meeting:

.1 schedule of the vessel (i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations etc.);

.2 provisions and arrangements for thickness measurements (i.e. access, cleaning/de-scaling, illumination, ventilation, personal safety);

.3 extent of the thickness measurements;

.4 acceptance criteria (refer to the list of minimum thicknesses);

.5 extent of close up survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion;

.6 execution of thickness measurements;

.7 taking representative readings in general and where uneven corrosion/pitting is found;

.8 mapping of areas of substantial corrosion;

.9 communication between attending surveyor(s), the TM operator(s) and Company representative(s) concerning findings.

5.4 A communication system should be arranged between the survey party in the tank or space being examined, the responsible officer on deck and, as the case may be, the navigation bridge. This system should also include the personnel in charge of handling the ballast pump(s) if rafts or boats are used. The communication arrangements should be maintained throughout the CAS survey.

Appendix 4 - CAS Schedule
CAS Schedule*

For the sole purpose of aid to the Companies and Recognized Organizations in the preparation of the CAS Survey and shall be read and used for this purpose only.

	Activity/Milestone	Responsible Party	CAS Reference
Min. 8 months	Notification to RO and Administration	Co	6.1.1.2
Min. 7 months	Issuance to Company of the Survey Planning Questionnaire	RO	6.1.1.3.1
	Instructions to Company and RO	Adm	11.1-2 & -4
Min. 5 months	Return completed Survey Planning Questionnaire to RO	Co	6.1.1.4
	Develop and agree Survey Plan	RO/Co/Adm	6.1.2.1
Min. 2 months	Submission of signed Survey Plan to RO and Admoinistration	Co	6.1.1.5
	Examine documenntation	RO/Adm	6.3.2
	Survey meeting and Commencement of CAS survey	Co/RO/TM/Adm	7.1.1
	Completion of CAS survey	RO/Co	7.1.7 & 9.2
	Submission of signed CAS survey report to RO Headquarters and issuance of an Interim Statement of Compliance	RO surveyor	9.7 & 13.7
	Review and verification of the CAS documentation by the RO HQ	RO HQ	10.1.1
Max. 3 months	Submission CAS Final Report to the Administration	RO HQ	10.2.2
	Review and verification of the CAS Final Report by the Administration	Adm	11.3
Max. 5 months	Issuance and forwarding of Statement of Compliance and Review Record to Company and RO	Adm	13
	Communication of CAS survey results to the IMO	Adm	14.1
	Circulation of information to Parties to MARPOL	IMO	14.2

* Incorporated from MEPC/Circ.390 and Resolution MEPC.112(50)

Appendix 5-1 The Wastage Allowance

(1) Principal structural hull members

(i) The wastage allowance (diminution limits) for plates and stiffeners are shown in the following table.

(ii) The wastage allowance for longitudinal strength members given in the following table are based on the condition that the diminution limit of longitudinal strength of the hull has not been reached.

(iii) The values of the wastage allowance indicate limit values in case of uniform wear of members.

(iv) Notwithstanding the following table, the wastage allowance for local corrosion such as stress corrosion and pitting are to be decided at the discretion of the Surveyor. The standard diminution limit for local corrosion other than stress corrosion is to be taken as 40% of the original thickness.

Structural Member	Wastage Allowance
-Shell plates -Strength deck plates -Slab longls on shear strake and stringer plate of strength deck -Tight bulkheads in deep tanks -Inner bottom plates	20% of original thickness + 1 mm
-Floors and girders in double bottom -Primary members (web & face) -Web, face and bracket of hold frames -Watertight bulkhead plates	25% of original thickness
-Web and face of frames (excluding hold frames), longls beams, stiffeners and brackets -Effective deck plates	30% of original thickness

(2) Minimum thickness for high tensile steel members

If high-tensile steel is used in bottom longitudinals of tankers with a single bottom construction, the wear and tear limit of the web is taken as 25% of the original thickness. If high-tensile steel is used in other structural members, the wear and tear limit is to be in accordance with (1) and (2) above.

(3) Measure against corrosion

When remarkable corrosion is found in the results of thickness measurement, the Surveyor should examine the pattern and extent of the corrosion through intensive inspection or thickness measurement and take a necessary measure such as (i) & (ii) below. Where *substantial corrosion* is found, the additional thickness measurement is required. ***Substantial corrosion*** **is an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of the wastage allowance, but within acceptable limits.**

(i) Corrosion exceeding acceptable limit

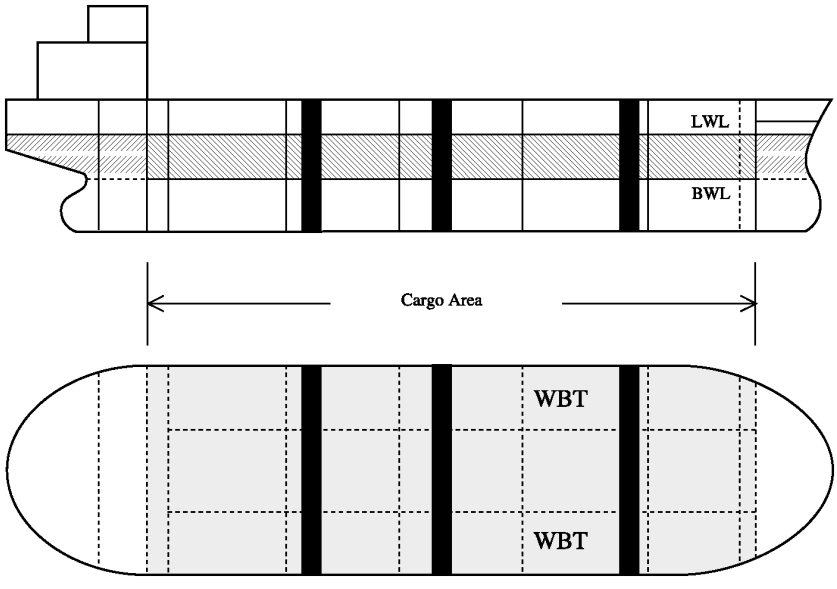
The Surveyor should require repair such as renewal of the corroded plate exceeding acceptable limit. However, special consideration may be given for structural members whose actual scantling surpasses much the Rule requirements.

(ii) *Substantial corrosion*

The Surveyor should give necessary instruction for further inspection of corrosion which does not exceed acceptable limit, but where continuous monitoring is deemed necessary. S*ubstantial corrosion* in excess of 75% of allowable margin is to be nominated as *suspect area* and thickness measurement and necessary inspections of the area is to be carried out at subsequent Intermediate Survey.

Appendix 5-2 Thickness Measurement Plan

-1. *Suspect area* (See **Note 1**)
-2. Structural members subject to Close-up Survey
-3. Systematic thickness measurement (See the figure below)
   (1)Each deck and bottom plate within the cargo area
   (2)All longitudinal members in three transverse sections within the cargo area
   Transverse sections are to be selected in consideration of (a), (b) and (c) below.
   (a) Two transverse sections of the three are to be chosen within 0.4L amidships for the extent of the hull girder length and between 0.4L and 0.5L amidships.
   (b) Transverse sections should be chosen such that thickness measurements can be taken for as many different tanks in corrosive environments as possible. Ballast tanks sharing a common plane boundary with cargo tanks fitted with heating coils and cargo tanks permitted to be filled with sea water should be selected where present.
   (c) Transverse sections should be located where the largest thickness reductions are suspected to occur or are revealed from deck and bottom plating measurements prescribed in (1) above and should be clear of areas which have been locally renewed or reinforced.
   (3)Wind and water strakes outside the cargo area (at least two strakes on each side)
   (4)Wind and water strakes inside the cargo area (all strakes on each side)
-4. Internals in FPT&APT, exposed main deck and bottom outside of cargo area, keel full length, superstructure deck
-5. All exposed main deck plates outside the cargo area and all exposed first tier superstructure deck plates.
-6. Standards for measuring points are to be referred to.



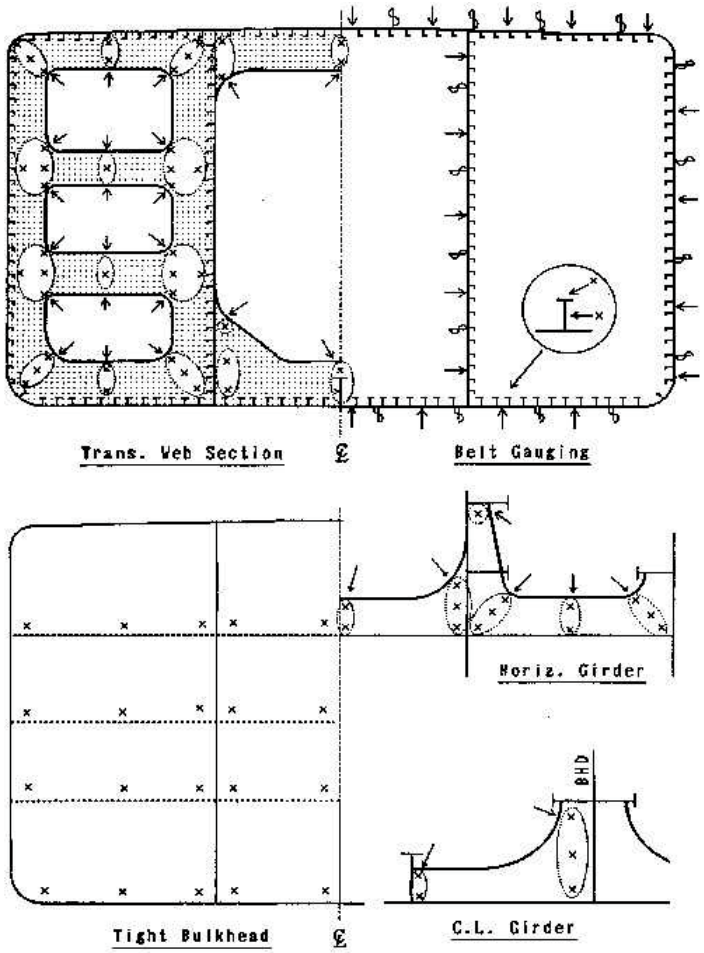
(Upper Deck & Bottom Plan)

Standards for Measuring Points

-1. Thickness measurement for the structural members subject to close-up survey
Standards of measuring points for the structural members subject to close-up survey such as trans. ring, etc. are shown in the figures below. Taking into account of the ship's age and structural system of the members, the number of measuring points is to be adjusted as appropriate.

-2. Thickness measurement for transverse section, etc.
(1) Belt gauging
-Platings: Every deck flange and bottom flange should be measured at one point between longitudinals. All the other platings should be measured at one point per strake.
-Longitudinals: Every longitudinal should be measured on the web and face plate.
(2) Thickness measurement for shell platings, deck platings, etc.
Two points are to be measured in each plate of side shell, bottom shell, upper deck, etc. where thickness measurements of all plates or along the length of the plate are required.

-3. *Substantial corrosion*
Where *substantial corrosion* is found through the results of thickness measurements, extent of thickness measurement (number of structural members and measuring pints) is to be increased in accordance with the direction of the Surveyor and with requirements specified in **Note 2**.



Note 1 Suspect area

Where *suspect areas* are found through internal examination and close-up surveys, detailed thickness measurement is to be carried out under the direction of the Surveyor. Following structural members are liable to have *substantial corrosion* and careful inspections of these parts are requested at surveys.

1 Deck and superstructure
- Upper deck
  Forward part of upper deck; Cross deck plates, especially where bilge water is liable to remain; Hatches and associated decks; deck plates underneath steam pipes
- F'cle, poop and deck house
  End bulkheads (wall) of superstructures; Lower part of deck house boundaries, especially in way of pipe penetration and drain plugs; top plates in way of bilge courses and deck scuppers; Areas under the deck machinery (winches/windlasses) and fairleaders/bollards
- Deck plates in superstructure (especially tank top of deep tanks)
- Hatch coamings and stays
  Lowest parts; Areas around steam pipes; Coamings and stays in cross deck
- Bulwarks and stays
  Lower parts; Areas in way of expansion joints/cargo ports/stanchions
- Hatch covers (especially pontoon type)

2 Shell plate
- Side shell plates between ballast water line and load water line
- Forward bottom/side shell plates (especially along welding joints)

3 Internal structural members
- Hold frames at connection to tank side brackets and along welds to side shell
- Lowest part of transverse bulkheads (above inner bottom or lower deck)
- Boundaries in chain locker
- Structural members under sea water pumps, and sea chests in machinery space and cargo pump room

4 Structural members in tanks
- Structural members in deep tanks whose tank top is upper deck
- Longitudinal bulkhead and their associated members in wing tanks/spaces of oil tankers and ore carriers
- Structural members in ballast tanks adjacent to fuel oil tanks
- Areas in way of slot openings and lightening holes in floors, etc.
- Bottom platings around and under bell mouths and sounding pipes
- Horizontal members in cargo oil tanks (Bottom plates, Faces of bottom girders, Horizontal girders, etc.)
-

Note 2 Additional thickness measurement

1. Substantial corrosion

Substantial corrosion is an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of allowable margins, but within acceptable limits. When *substantial corrosion* is found in the results of thickness measurements, the extent and points of the thickness measurement are to be increased to the satisfaction of the Surveyor. Additional thickness measurements are required in accordance with the following **2.** to **4.**

2. Additional thickness measurement for oil tankers and chemical carriers

In the case of oil tankers or chemical carriers, additional thickness measurement is to be carried out for all structural members listed in the table among -1. through -4., of which the title corresponds to substantially corroded members.

-1. Bottom Structure (single & double bottom and hopper structure)

Structural member	Extent of Measurement	Pattern of Measurement
1. Inner bottom, bottom and hopper structure plating	a) Minimum of 3 bays across tank, including aft bay. Measurements around and under all bell mouths. b) Suspect plate and adjacent plates, if any	a) 5 point pattern for each panel between longitudinals and floors / webs b) 5 point pattern for each panel between longitudinals over 1 *m* length
2. Inner bottom, bottom and hopper structure longitudinals	Minimum of 3 longitudinals in each bay where plating measured.	3 measurements in line across flange and 3 measurements on vertical web.
3. Bottom girders and brackets (only for oil tankers)	At fore and aft floors or transverse bulkhead bracket toes, and in centre of tanks.	Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face flat, if any. 5 point pattern on girder / bulkhead brackets, if any.
4. Bottom transverse webs / floors (only for oil tankers)	3 webs / floors in bays where bottom plating measured, with measurements at both ends and middle.	5 point pattern over 2 m^2 area. Single measurements on face flat, if any.
5. Longitudinal girders and Transverse floors in double bottom (only for ships carrying dangerous chemicals in bulk)	Suspect plate	5 point pattern over about 1 m^2
6. Panel stiffening (if any)	Where fitted.	Single measurement
7. Hopper structure web frame rings (only for double hull oil tankers)	3 web frame rings in bays where bottom plating measured.	5 point pattern over 1 m^2 of plating. Single measurements on flange.
8. Hopper structure transverse watertight bulkheads or swash bulkheads (only for double hull oil tankers)	a) lower 1/3 of bulkhead b) upper 2/3 of bulkhead c) stiffeners (minimum of three)	a) 5 point pattern over 1 m^2 of plating b) 5 point pattern over 2 m^2 of plating c) For web, 5 point pattern over span (two measurements across web at each end and one at centre of span). For flange, single measurements at each end and centre of span.

Structural member	Extent of Measurement	Pattern of Measurement
9. Hopper structure transverse watertight bulkheads (only for ships carrying dangerous chemicals in bulk)	a) lower 1/3 of tank b) upper 2/3 of tank	a) 5 point pattern over about 1 m^2 b) 5 point pattern alternate plates over 1 m^2 of plating
10. Hopper structure web frame rings (only for ships carrying dangerous chemicals in bulk)	Suspect plate	5 point pattern

-2. Deck Structure

Structural member	Extent of Measurement	Pattern of Measurement
1. Deck plating	· Two transverse bands across tank	Minimum of three measurements per plate per band
2. Deck longitudinals	· Minimum of 3 longitudinals in each of two bays (except for double hull oil tankers) · Every third longitudinal in each of two bands with a minimum of one longitudinal (only for double hull oil tankers)	3 measurements in line vertically on webs, and 2 measurements on flange (if fitted)
3. Deck girders and brackets	· At fore and aft transverse bulkhead, bracket toes and in centre of tanks	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across flange. 5 point pattern on girder / bulkhead brackets
4. Deck transverse webs	· Minimum of two webs with measurements at both ends and middle of span	5 point pattern over about 2 m^2 (for double hull oil tankers, 1 m^2) areas. Single measurement on flange.
5. Vertical webs and transverse bulkheads in wing ballast tank (within 2 *m* from deck) (only for double hull oil tankers)	· Minimum of two webs, and both transverse bulkheads	5 point pattern over 1 m^2 areas.
6. Panel stiffening	· Where applicable	Single measurement

-3. Shell and Longitudinal Bulkhead

Structural member	Extent of Measurement	Pattern of Measurement
1. Side shell and longitudinal bulkhead plating: · Deckhead and bottom strakes, and strakes in way of horizontal stringers · All other strakes	· Plating between each pair of longitudinals in a minimum of 3 bays · Plating between every 3rd pair of longitudinals in same 3 bays	· Single measurement · Single measurement
2. Side shell and longitudinal bulkhead longitudinal on : · Deckhead and bottom strakes · All others strakes	· Each longitudinal in same 3 bays · Every third longitudinal in same 3 bays	· 3 measurements across web and 1 measurement of flange · 3 measurements across web and 1 measurement on flange
3. Longitudinals-brackets	· Minimum of three at top, middle and bottom of tank in same 3 bays	· 5 point pattern over area of bracket
4. Vertical webs and transverse bulkheads (excluding deckhead area) (only for wing ballast tanks of double hull oil tankers): · strakes in way of horizontal girders · All other strakes	· Minimum of 2 webs and both transverse bulkheads · Minimum of 2 webs and both transverse bulkheads	· 5 point pattern over approximately 2 m^2 area · 2 measurements between each pair of vertical stiffeners
5. Horizontal girders (only for wing ballast tanks of double hull oil tankers)	· Plating on each girder in a Minimum of 3 bays	· 2 measurements between each pair of horizontal girder stiffeners
6. Horizontal girders stiffeners (only for wing ballast tanks of double hull oil tankers)	· Where applicable	· Single measurement
7. Web frames / transverses and cross ties (except for wing ballast tanks of double hull oil tankers)	· 3 webs with minimum of three locations on each web, including in way of cross tie connections	· 5 point pattern over about 2 m^2 area, plus single measurement on flanges of web frame / transverses and cross tie
8. Lower end brackets (opposite side of transverses) (only for cargo tanks of double hull oil tankers)	· Minimum of three brackets	· 5 point pattern over approximately 2 m^2 area, plus single measurement on bracket flanges

-4. Transverse Bulkheads and Swash Bulkheads

Structural member	Extent of Measurement	Pattern of Measurement
1. Upper and lower stool, where fitted	· Transverse band within 25*mm* of welded connection to inner bottom / deck plating · Transverse band within 25*mm* of welded connection to shelf plate	5 point pattern over 1 *m* length
2. Deckhead and bottom strakes, and strakes in way of horizontal stringers	Plating between pair of stiffeners at three locations: approximately 1/4, 1/2 and 3/4 width of tank	5 point pattern between stiffeners over 1 *m* length
3. All other strakes	Plating between pair of stiffeners at middle location	Single measurement
4. Strakes in corrugated bulkheads	Plating for each change of scantling at centre of panel and at flange of fabricated connection	5 point pattern over about 1 m^2 of plating
5. Stiffeners	Minimum of three typical stiffeners	For web, 5 point pattern over span between bracket connections (2 measurements across web at each bracket connection, and one at centre of span). For flange, single measurement at each bracket toe and at centre of span.
6. Brackets	Minimum of three at top, middle and bottom of tank	5 point pattern over area of bracket
7. Deep webs and girders	Measurements at toe of racket and centre of span	For web, 5 point pattern over about 1 m^2. 3 measurements across face flat.
8. Horizontal Stringers	All horizontal stringers with measurements at both ends and middle	5 point pattern over 1 m^2 area, plus single measurements near bracket toes and on face flats

ANNEX 1

AMENDMENTS TO ANNEX 1 OF MARPOL 73/78

The existing regulation 13G is replaced by the following:

"Regulation 13G

Prevention of accidental oil pollution - Measures for existing oil tankers

(1) Unless expressly provided otherwise this regulation shall:

(a) apply to oil tankers of 5,000 tons deadweight and above, which are contracted, the keels of which are laid, or which are delivered before the dates specified in regulation 13F(1) of this Annex; and

(b) not apply to oil tankers complying with regulation 13F of this Annex, which are contracted, the keels of which are laid, or are delivered before the dates specified in regulation 13F(1) of this Annex; and

(c) not apply to oil tankers covered by subparagraph (a) above which comply with regulation 13F(3)(a) and (b) or 13F(4) or 13F(5) of this Annex, except that the requirement for minimum distances between the cargo tank boundaries and the ship side and bottom plating need not be met in all respects. In that event, the side protection distances shall not be less than those specified in the International Bulk Chemical Code for type 2 cargo tank location and the bottom protection distances at centreline shall comply with regulation 13E(4)(b) of this Annex.

(2) For the purpose of this regulation:

(a) "Heavy diesel oil" means diesel oil other than those distillates of which more than 50 per cent by volume distils at a temperature not exceeding 340ºC when tested by the method acceptable to the Organization[1].

(b) "Fuel oil" means heavy distillates or residues from crude oil or blends of such materials intended for use as a fuel for the production of heat or power of a quality equivalent to the specification acceptable to the Organization[2].

(3) For the purpose of this regulation, oil tankers are divided into the following categories:

(a) "Category 1 oil tanker" means an oil tanker of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying oil other than the above, which does not comply with the requirements for new oil tankers as defined in regulation 1(26) of this Annex;

(b) "Category 2 oil tanker" means an oil tanker of 20,000 tons deadweight and above carrying crude oil, fuel oil, heavy diesel oil or lubricating oil as cargo, and of 30,000 tons deadweight and above carrying oil other than the above, which

1 Refer to the American Society for Testing and Material's Standard Test Method (Designation D86).

2 Refer to the American Society for Testing and Material's Specification for Number Four Fuel Oil (Designation D396) or heavier.

complies with the requirements for new oil tankers as defined in regulation 1(26) of this Annex; and

(c) "Category 3 oil tanker" means an oil tanker of 5,000 tons deadweight and above but less than that specified in subparagraph (a) or (b) of this paragraph.

(4) An oil tanker to which this regulation applies shall comply with the requirements of regulation 13F of this Annex not later than 5 April 2005 or the anniversary of the date of delivery of the ship on the date or in the year specified in the following table:

Category of oil tanker	**Date or year**
Category 1	5 April 2005 for ships delivered on 5 April 1982 or earlier 2005 for ships delivered after 5 April 1982
Category 2 and Category 3	5 April 2005 for ships delivered on 5 April 1977 or earlier 2005 for ships delivered after 5 April 1977 but before 1 January 1978 2006 for ships delivered in 1978 and 1979 2007 for ships delivered in 1980 and 1981 2008 for ships delivered in 1982 2009 for ships delivered in 1983 2010 for ships delivered in 1984 or later

(5) Notwithstanding the provisions of paragraph (4) of this regulation, in the case of a Category 2 or 3 oil tanker fitted with only double bottoms or double sides not used for the carriage of oil and extending to the entire cargo tank length or double hull spaces which are not used for the carriage of oil and extend to the entire cargo tank length, but does not fulfill conditions for being exempted from the provisions of paragraph (1)(c) of this regulation, the Administration may allow continued operation of such a ship beyond the date specified in paragraph (4) of this regulation, provided that:

(a) the ship was in service on 1 July 2001;

(b) the Administration is satisfied by verification of the official records that the ship complied with the conditions specified above;

(c) the conditions of the ship specified above remain unchanged; and

(d) such continued operation does not go beyond the date on which the ship reaches 25 years after the date of its delivery.

(6) A Category 2 or 3 oil tanker of 15 years and over after the date of its delivery shall comply with the Condition Assessment Scheme adopted by the Marine Environment Protection Committee by resolution MEPC.94 (46), as may be amended, provided that such amendments shall be adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention relating to amendment procedures applicable to an appendix to an Annex.

(7) The Administration may allow continued operation of a Category 2 or 3 oil tanker beyond the date specified in paragraph (4) of this regulation, if satisfactory results of the Condition Assessment Scheme warrant that, in the opinion of the Administration, the ship is fit to continue such operation, provided that the operation shall not go beyond the anniversary of the date of delivery of the ship in 2015 or the date on which the ship reaches 25 years after the date of its delivery, whichever is the earlier date.

(8) (a) The Administration of a Party to the present Convention which allows the application of paragraph (5) of this regulation, or allows, suspends, withdraws or declines the application of paragraph (7) of this regulation, to a ship entitled to fly its flag shall forthwith communicate to the Organization for circulation to the Parties to the present Convention particulars thereof, for their information and appropriate action, if any.

(b) A Party to the present Convention shall be entitled to deny entry into the ports or offshore terminals under its jurisdiction of oil tankers operating in accordance with the provisions of :

(i) paragraph (5) of this regulation beyond the anniversary of the date of delivery of the ship in 2015; or

(ii) paragraph (7) of this regulation.

In such cases, that Party shall communicate to the Organization for circulation to the Parties to the present Convention particulars thereof for their information."