

PORT STATE CONTROL COMMITTEE INSTRUCTION 43/2010/28

GUIDELINES FOR PORT STATE CONTROL OFFICERS ON CHECKING SHIP HULL STRUCTURE CONDITION ON THE BASIS OF RESIDUAL THICKNESS MEASUREMENTS' REPORTS

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1. Introductory remarks.

Paragraph 3.8 of Paris Memorandum requires that "...Where the decision to send a ship to a repair yard is due to a lack of compliance with IMO Resolution A.744 (18), as amended, either with respect to ship's documentation or with respect to ship's structural failures and deficiencies, the Authority may require that the necessary thickness measurements (TM) are carried in the port of detention before the ship is allowed to sail".

Paragraph 39 of Annex 10 of Paris MoU requires, inter alia, that Survey Report Files (SRF) for bulk carriers or oil tankers should be readily available for initial inspection and examination by PSCOs.

Apart from those, procedures for control of operational requirements further instruct PSCOs on how to deal with the structural integrity and seaworthiness of bulk carriers and oil tankers. Their provisions prescribe, in particular, that:

- the SRFs required by Resolution A.744(18) as amended should contain reports on structural surveys, condition evaluation reports (translated into English and endorsed by flag State Administration), thickness measurement reports and a survey planning document;
- if there are any inconsistencies in the SRF, or if it is missing, then PSCO should give special attention to "...hull structure, piping systems in way of cargo tanks or holds, pump-rooms, cofferdams, pipe tunnels, void spaces within the cargo area, and ballast tanks" in the course of a more detailed inspection;
- in case of bulk carriers, PSCO should "...inspect holds' main structure for any obviously unauthorized repairs".

Further on, Guidance on type of inspection prescribes examination of one ballast tank on oil tankers while carrying out mandatory expanded inspections of tankers having a GT of more than 3000 and older than 15 years of age, and verification of SRF on the said oil tankers and bulk carriers older than 12 years.

In addition to the above, general guidance on how to conduct inspections of the hull structure of bulk carriers is given in PSCC Instruction *Guidance for checking the structure of Bulk Carriers* currently in force within Paris MOU.

References to all detailed requirements for surveys under the so-called "enhanced programme of inspections", or "ESP", are given in IMO Assembly Resolution A.744(18) as amended.

TM is part of a complex work consisting of a collection of factual data, and its subsequent analysis aimed at defining the degree of risk involved. This work should be performed by suitably qualified Flag State surveyors, or, which is more common, delegated to recognized organizations (RO, classification societies), due to the relative complexity of the analysis and amount of computation ensuing.

Port State Control, remaining a sampling process by its very nature, cannot substitute for ESP nor oversee TM, and is intended to complement it and identify failures of complying with its requirements, if any.

2. Purpose:

The purpose of the present Guidelines is to provide PSCOs with necessary indications on residual thickness measurement as regards:

- completeness and correctness of measurements recorded in available corresponding SRF section(s) in relation to the actual condition of ship structures;
- procedures of measurement in relation to: who is authorized to carry them out; by which means such measurements may be made; what is allowable thickness reduction; which format thickness measurement (TM) reports should follow; how the TM reports should be planned and how should they be formatted;
- criteria of technical assessment of the risk represented by worn structural members;

- how to direct a vessel to undertake TM if considered necessary in accordance with Paris MoU paragraph 3.8.

3. Scope of application.

IMO Assembly Resolution A.744(18) has been amended six times by now, by MSC.49(66), MSC.105(73), SOLAS/CONF. 4/25, MSC.125(75), MSC.144(77) MSC.197(80)

Annex A to the said Resolution covers bulk cargo ships, and Annex B deals with oil tankers; Part A of Annex B deals with double-hull tankers, and Part B with ships other than double-hull ones.

The Guidelines appearing herein embrace all the amendments referred to above, and should apply to all self-propelled bulk cargo carriers and all oil (single and double hull) tankers of 500 gross tonnage and above.

As it follows from the common practice, consideration of previous TM results (as well as conducting new TM) forms part of mandatory surveys prescribed by the SOLAS Convention (in relation to the Cargo Ship Construction Certificate). Residual thickness measurements as such may be made at any other time between such surveys, and during these surveys as well (especially during drydocking surveys). In case when a so-called 'close-up examination' (ref. A.744(18) as amended) shows that no structural diminution and/or loss of coating efficiency took place, TM in some cases may be dispensed with at all or reduced correspondingly.

It should be particularly noted that not only bulk carriers and oil tankers carry on board TM reports. Some Flag States and some ROs introduced practice of TM on other ship types (dry cargo ships, in particular). As this practice does not fall into the scope of PSC procedures under Paris MOU rules, in case of doubt PSCOs should contact such Flag States and/or their ROs for clarifications, prior to drawing any decision.

It should be also observed that the present Guidelines do not cover instances of an obvious need to repair or renew structures, such as cracks, holes, fractures, grooving, buckling, detachment, pitting, and likewise. Equally, no guidance on how to assess 'acceptable defects' (according to A.744(18) terminology), i.e. residual local deformations such as bents, slope of beams & longitudinals, stiffeners etc., is given here. All this means that only even wear due to corrosion, physical contact of structures with extraneous items (e.g. with ice, grabs, bull-dozer blades...) is considered.

It may be stressed that the present Guidelines should not be construed as a stand-alone document, and they are intended to be used in conjunction with A.744(18), which they cannot replace, due to the complexity and specific character of that Resolution. Therefore these Guidelines may be taken rather as a shortcut to A.744(18).

Finally, it should be observed that the Guidelines do **not** cover oil tankers subject to the Condition Assessment Scheme (CAS), as provided for in Resolutions of the IMO's Marine Environment Protection Committee MEPC.94(46), Amended by MEPC.99(48), MEPC.112(50), MEPC.131(53), MEPC.155(55). For CAS tankers, refer to these instruments for details.

4. Action undertaken by PSCO.

At any PSC inspection of ships subject to the Enhanced Programme of Inspections (ESP), especially mandatory expanded inspections of oil tankers and bulk carriers, as defined by the Guidance on type of inspection, the PSCO should

4.1. check the availability of SRF and TM reports being part thereof on board. Tables 1 through 7 in Annex 1 of these Guidelines may be used to evaluate the completeness and correctness of the SRF and any required TM;

4.2 in case SRF are missing, the ship is strongly considered for detention and, as a minimum, the PSCO should act in accordance with paragraphs 5.2.4 and 5.2.5 of Annex 1 to Paris MoU. Due regard should be paid to the safety of inspection (gas-freeing of inspected compartments, absence of explosive vapours, personal safety equipment, communication etc.);

4.3 if results of the check referred to in 4.1 indicate to serious and uneven wastage of hull structures, including piping systems, the PSCO should:

4.3.1 contact flag State Administration and/or its Recognized Organization (RO) for investigating reasons of the absence of SRF;

4.3.2 in case no answer is received, and depending on the degree of wastage, the PSCO may require the vessel to carry out TM, clearly indicating the scope and extent of such measurements, having due regard, in particular for oil tankers, to Annex 4 to Part A of Annex B, and Annex 4 to Part B of Annex B to Resolution A.744 (18) as amended;

4.3.3 any measurements undertaken in accordance with 4.3.2 should be carried out by a TMC complying with requirements of Section 6 of the present document. It is highly desirable that the PSCO witnesses and validates the TM results;

4.3.4 assessment and evaluation of any TM results obtained according to 4.3.2 should be made by a RO having appropriate experience in ship structure strength assessment;

4.3.5 where the assessment and evaluation of TM results carried out by the RO indicate excessive wear and insufficient strength of ship hull structures, the PSCO will detain the ship and administer to carry out repairs either in his port or, if it is not feasible, at an agreed repair yard in accordance with Paris MoU paragraph 3.8. All these repairs should be conducted on conditions and by means approved by the RO in question.

Note: provisions of 4.3.3 do not preclude the PSCO from carrying out random TM at representative locations, but any results thereof should be brought to the attention of the RO in question for their consideration and appropriate action.

4.4 If SRF and related TM reports are in place, the PSCO will make sure that:

4.4.1 SRF are translated into English and endorsed by the Administration or RO acting on its behalf;

4.4.2 TM reports are duly verified and signed by the responsible flag State or RO surveyor;

4.4.3 TM reports are up-to-date as scheduled by the SRF;

4.4.4 TM are complete having due regard to Section 3 of the present Guidelines;

4.4.4 TM have been carried out by a TMC meeting requirements set out in Section 8, by means of instruments complying with Section 6, and in a format following provisions of Section 9 of the present Guidelines;

4.4.5 the last Condition Evaluation Report referred to in Section 10 is based on the actual TM carried out, adequately reflects their results (e.g. 'acceptable', or needs repairs/renewal, or treats a location as a 'suspect area' to be surveyed during next survey, etc.).

4.5 In case of any instance of non-compliance revealed when checking items 4.4.1 to 4.4.5, the PSCO will apply his/her professional judgment in assessing the risk represented by the item in question. An advice by the responsible Flag or RO surveyor is preferably to be taken.

4.6 For ships subject to mandatory expanded inspections (ref. Paris MoU, Annex 1, Section 8), a ballast compartment of a bulk carrier to be examined is preferably to be chosen on the basis of 'memoranda' referred to in Section 10 below, forming part of the last Condition Evaluation Report. Such compartment is likely to demonstrate the worst case of wastage (e.g. maximum number of 'suspect areas' etc.). In case of doubts, the PSCO may require the vessel to undertake TM, as provided for in paragraphs. 4.3.2 to 4.3.4 (or as set out in the Note after 4.3.5), and will act having regard to paragraph 4.3.5, if appropriate.

5. Thickness measurements and close-up survey requirements

5.1. Annual Survey. Thickness measurements during an annual survey are carried out when considered necessary by the surveyor. If such TM, should they have been conducted at the discretion of the surveyor, indicate that 'substantial corrosion' has been found, the scope of such TM should be increased as necessary, in accordance with the provisions of Annex 4 to Part B of Annex B to Resolution A.744(18) as amended (refer to A.744(18) for details).

5.2. Renewal Surveys:

5.2.1 Bulk carriers.

5.2.1.1 The extent of thickness measurements at renewal surveys for bulk carriers depends on the ship's age and is given in Table 1.

5.2.1.2. The scope of the close up survey for bulk carriers that must be conducted at a renewal survey depends on the ship's age and is given in Table 2.

5.2.2 Double Hull Oil Tankers.

5.2.2.1 The extent of thickness measurements at renewal surveys for double-hull oil tankers depends on the ship's age and is given in Table 3.

5.2.2.2 The scope of the close up survey for double-hull oil tankers that must be conducted at a renewal survey depends on the ship's age and is given in Table 4.

5.2.2.3 The minimum requirements for overall and close-up surveys and TM at intermediate surveys for double-hull oil tankers depends on the ship's age and is listed in Table 5.

5.2.3 Tankers other than Double Hulled

5.2.3.1. The extent of thickness measurements at renewal surveys for other oil tankers depends on the ship's age and is given in Table 6.

5.2.3.2. The scope of the close-up survey for other oil tankers that must be conducted at intermediate surveys depends on the ship's age and is given in Table 7.

6. Equipment for thickness measurement.

The PSCO should ascertain that TM have been carried out by means of ultrasonic test equipment (UTE). Accuracy of the UTE used should be recorded in TM reports.

7. Procedure of thickness measurement.

TM should normally be carried out under the supervision of the surveyor. However, the surveyor may accept TM results provided that:

- they were performed by a qualified company certified by an organization recognized by the Administration;
- their extent and accuracy are to the satisfaction of the surveyor, and
- such TM were carried out within 12 months prior to the completion of any preceding periodical or intermediate survey.

8. Requirements for the Thickness Measurement Company (TMC)

The TMC should be certified in accordance with the principles laid down in Annex 5 to Annex A, or Annex 7 to Part A of Annex B, or Annex 7 to Part B of Annex B to A.744(18), as appropriate, see A.744(18) as amended for details. The TMC certificate should be renewed/endorsed at intervals not exceeding 3 years by verification that original conditions that had enabled it to obtain its certificate, are duly maintained.

The TMC should be part of the survey planning meeting to be held prior to commencing the survey.

9. TM reporting

TM reports should generally follow formats laid down in the corresponding sections of A.744(18) as amended, namely:

9.1 for bulk carriers: reporting forms TM1-BC, TM2-BC, TM3-BC, TM4-BC, TM5-BC, TM6-BC, and TM7-BC should be used for recording thickness measurements (refer to Annex 8 to Annex A of A.744(18) for details);

9.2 for double-hull oil tankers, reporting forms TM1-DHT, TM2-DHT(i), TM2-DHT(ii), TM3-DHT, TM4-DHT, TM5-DHT and TM6-DHT should be used for recording thickness measurements (refer to Annex 10 to Part A of Annex B of A.744(18) for details);

9.3 for oil tankers other than double-hull, reporting forms TM1-T, TM2-T, TM3-T, TM4-T, TM5-T and TM6-T should be used for recording thickness measurements (refer to Annex 10 to Part B of Annex B of A.744(18) for details).

TM reports should be translated into English, give date or dates of TM taking, type(s) of measuring equipment, names of personnel together with their qualification, name and details of a TMC (see Section 6), and be verified and signed by the surveyor controlling TM on board.

For guidance, the TM reports should at least contain the following entries for every element measured:

- identification of an element; a scheme or sketch showing location of structural members subject to TM may be attached for clarity;
- original thickness in mm;
- gauged (residual) thickness in millimeters (mm);
- diminution of thickness, mm;
- maximum allowable diminution, mm. Note that the 'maximum allowable diminution', or 'allowable thickness reduction' (both terms in use by A.744(18)) is set up by the Administration;
- residual thickness as percentage of original thickness, %.

Reports may be accompanied by photos of elements measured, if deemed appropriate.

10. Evaluation of TM results

The results of TM are included in the Condition Evaluation Report as a part thereof. The Condition Evaluation Report should be endorsed by the Administration.

The TM results are then processed for calculating overall and local ship's strength characteristics, such as, e.g., section moduli (SM) values of the ship at chosen transverse sections of the hull (oil tankers having a length of 130 meters and over, and age of 10 years or more), or strength of cargo hatch cover securing arrangements of bulk carriers.

The said SM values obtained on the basis of residual thickness measurements (also taking into account of repairs and reinforcements), or cross-sectional data of worn structural members are then compared to the required values. On the basis of the outcome obtained, recommendations for further survey action are made (usually referred to as 'memoranda').

11. Abbreviations used in these Guidelines:

CAS
ESP

Condition Assessment Scheme
Enhanced programme of inspections

GT	Gross tonnage
IMO	International Maritime Organization
MEPC	Marine Environment Protection Committee
mm	millimeters
MSC	Maritime Safety Committee
Paris MoU	Paris Memorandum of Understanding
PSCO	Port State Control Officer
RO	Recognized Organization
SM	section moduli
SRF	Survey Report Files
TMC	Thickness Measurement Company
UTE	ultrasonic test equipment

Attachments:

- Table 1: Extent of TM at a Renewal Survey of Bulk Carriers
- Table 2: Scope of Close-Up Survey at Renewal Survey of Bulk Carriers
- Table 3: Extent of TM at Renewal Survey of Double-Hull Tankers
- Table 4: Minimum Requirements for Close-up Survey at Renewal Survey of Double-Hull Oil Tankers
- Table 5: Minimum Requirements for Overall and Close-Up Surveys and TM at Intermediate Survey of Double-Hull Oil Tankers
- Table 6: Extent of TM at Renewal Survey for Tankers other than Double-Hull
- Table 7: Scope of Close-Up Survey Requirements at Renewal Survey of Tankers other than Double-Hull

Table 1 – extent of TM at a renewal survey of bulk carriers

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
Suspect areas*	Suspect areas*	Suspect areas*	Suspect areas*
	Within the cargo length area:	Within the cargo length area:	Within the cargo length area:
	Two transverse sections of deck plating outside the line of cargo hatch openings	Each deck plate outside the line of cargo hatch openings	Each deck plate outside the line of cargo hatch openings
		Two transverse sections, one of which should be in the amidship area, outside the line of cargo hatch openings	Three transverse sections, one of which should be in the amidship area, outside the line of cargo hatch openings
			Each bottom plate
	Measurement, for general assessment and recording of corrosion pattern, of those structural	Measurement, for general assessment and recording of corrosion pattern, of those structural	Measurement, for general assessment and recording of corrosion pattern, of those structural

	members subject to close-up survey**, see Table 2.	members subject to close-up survey**, see Table 2.	members subject to close-up survey**, see Table 2.
	Selected cargo hold hatch covers and coamings (plating and stiffeners)	All cargo hold hatch covers and coamings (plating and stiffeners)	All cargo hold hatch covers and coamings (plating and stiffeners)
	Selected areas of deck plating inside the line of openings between cargo hold hatches	All deck plating inside the line of openings between cargo hold hatches	All deck plating inside the line of openings between cargo hold hatches
	All wind and water strakes within the cargo length area	All wind and water strakes within the cargo length area	All wind and water strakes within the cargo length area
		Selected wind and water strakes outside the cargo length area	Selected wind and water strakes outside the cargo length area

Notes:

*) 'suspect area' stands for location showing substantial corrosion and/or considered by the surveyor to be prone to rapid wastage;

***) 'close-up survey' is a survey where the details of structural components are within the close visual inspection range of the surveyor, preferably within reach of hand. To be carried out at each renewal survey; the extent of close-up survey (also during a renewal survey) should correspond to the requirements of Table 2.

Table 2 – Scope of close-up survey at renewal survey of bulk carriers

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
25% of frames in the forward cargo hold at representative positions	25% of frames in the forward cargo hold at representative positions	25% of frames in all cargo holds	All frames in all cargo holds
Selected frames in remaining cargo holds	Selected frames in remaining cargo holds		
		Two transverse sections, one of which should be in the amidship area, outside the line of cargo hatch openings	Three transverse sections, one of which should be in the amidship area, outside the line of cargo hatch openings
			Each bottom plate
	Measurement, for general assessment and recording of corrosion pattern, of	Measurement, for general assessment and recording of corrosion pattern, of	Measurement, for general assessment and recording of corrosion pattern, of

	those structural members subject to close-up survey	those structural members subject to close-up survey	those structural members subject to close-up survey
	Selected cargo hold hatch covers and coamings (plating and stiffeners)	All cargo hold hatch covers and coamings (plating and stiffeners)	All cargo hold hatch covers and coamings (plating and stiffeners)
	Selected areas of deck plating inside the line of openings between cargo hold hatches	All deck plating inside the line of openings between cargo hold hatches	All deck plating inside the line of openings between cargo hold hatches
	All wind and water strakes within the cargo length area	All wind and water strakes within the cargo length area	All wind and water strakes within the cargo length area
		Selected wind and water strakes outside the cargo length area	Selected wind and water strakes outside the cargo length area

Notes:

Under ESP, a ‘renewal survey’ is a procedure which may be commenced at the fourth annual survey, and be progressed during the succeeding year with a view to completion by the fifth anniversary date. As to the thickness measurement, it should not be held before the fourth annual survey.

2) ‘Substantial corrosion’ in this context is an extent of corrosion such that assessment of corrosion pattern indicates wastage in excess of 75% of allowable margins, but still within the acceptable limits.

3) Thickness measurements during an intermediate survey are carried out to an extent sufficient to determine general and local corrosion levels in areas subject to close-up survey (see Note **) to Table 1), and in areas found to be ‘suspect’ (see Note *) to Table 1) at the previous renewal survey. If ‘substantial corrosion’ is found, the scope of TM should be increased, up to the extent indicated in Tables 1 and 2. However, TM may be dispensed with, provided that the surveyor is satisfied by the results of close-up survey, that there is no structural diminution, and the coating (where applied) remains effective. Where a protective coating in cargo holds is found in good condition (having only minor spot rusting), the extent of close-up survey and TM may be suitably reduced.

Table 3 – double-hull tankers, extent of TM at renewal survey

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
One section of deck plating for the full	Within the cargo area: .1 each deck plate;	Within the cargo area: .1 each deck plate;	Within the cargo area: .1 each deck plate;

beam of the ship within the cargo area	.2 one transverse section	.2 two transverse sections*; .3 all wind and water strakes	.2 three transverse sections*; .3 each bottom plate; .4 all wind and water strakes
	Selected wind and water strakes outside the cargo area	Selected wind and water strakes outside the cargo area	Selected wind and water strakes outside the cargo area
Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey**	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey**	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey**	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey**
Suspect areas	Suspect areas	Suspect areas	Suspect areas
* at least one section should be within 0.5L amidships; ** see table 4, including notes 1 to 7 thereto.			

Notes:

1. "close-up survey": see note **) to Table 1 and Table 4 together with notes 1 to 7 thereto defining areas of close-up survey;
2. in case where 'substantial corrosion' is found, the extent of TM shown in Table 3 should be increased in accordance with the provisions of Annex 4 to Part A of Annex B to Resolution A.744(18) as amended (refer to A.744(18) for details).

Table 4 – minimum requirements for close-up survey at renewal survey of double-hull oil tankers

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
One web frame (1), in a complete ballast tank (see A)	All web frames (1), in a complete ballast tank (see A). The knuckle area and the upper part (5m approximately) of one web frame in each remaining ballast tank (6)	All web frames (1) in all ballast tanks	As for ships 10 < age ≤ 15; additional transverse areas as deemed necessary by the Administration
One deck transverse, in a cargo oil tank (2)	One deck transverse, in two cargo oil tanks (2)	All web frames (7), including deck transverse and cross-ties, if fitted, in a cargo oil tank. One web frame (7), including deck transverse and cross-ties, if fitted, in each remaining cargo oil tank.	
One transverse bulk-	One transverse bulk-	All transverse bulk-	

head (4), in a complete ballast tank (see A)	head (4), in a complete ballast tank (see A)	heads, in all cargo oil (3) and ballast (4) tanks	
One transverse bulk-head (5) in a cargo oil centre tank. One transverse bulk-head (5) in a cargo oil wing tank (see B)	One transverse bulk-head (5) in two cargo oil centre tanks. One transverse bulk-head (5) in a cargo oil wing tank (see B)		

Notes:

1. 'Web frame' in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank, and deck transverse in double deck tank (if any), including adjacent structural members. In fore and aft peak tanks, 'web frame' means complete transverse web frame ring including adjacent structural members.
2. Deck transverse, including adjacent deck structural members (or external structure on deck in way of the tank, if any).
3. Transverse bulkhead complete in cargo tanks, including girder system, adjacent structural members (e.g. longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.
4. Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets.
5. Transverse bulkhead lower part in cargo tank, including girder system, adjacent structural members (e.g. longitudinal bulkheads) and internal structure of lower stool, where fitted.
6. The knuckle area and the upper part (5m approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2m from the corners both on the bulk-head and the double bottom.
7. 'Web frame' in a cargo oil tank means deck transverse, longitudinal bulkhead vertical girder and cross-ties, if any, including adjacent structural members.

Areas 1 to 7 are areas subjected to close-up surveys and TM.

A: 'complete ballast tank' means a double bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.

B: where no centre tanks are fitted (as in the case of a centre longitudinal bulkhead), transverse bulk-heads in wing tanks should be surveyed.

See note 1) to Table 2 as regards the renewal survey.

See note 3) to Table 2 as regards substantial corrosion.

Table 5 Minimum Requirements for Overall and Close-Up Surveys and TM at Intermediate Survey of Double-Hull Oil Tankers.

5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
Overall survey* of representative salt water ballast tanks selected by the attending surveyor (selection should include fore and aft peak tanks & three other tanks where a protective coating is found in poor condition)	Overall survey* of all salt water ballast tanks, including combined cargo/ballast tanks, if any	As for renewal survey, see Table 4.
	Overall survey* of at least two representative cargo tanks	
	Close-up survey in salt water ballast tanks of: - all web frames (1) in one complete tank (see A) – the knuckle area and the upper part (appr. 5m) of one web frame in each remaining ballast tank (6); - one transverse bulkhead (4) in each complete tank (see A)	
	Close-up survey in two cargo tanks (or two combined cargo/ballast tanks, where fitted). The extent of surveys should be based on the records of the previous renewal survey and repair history of the tanks	
TM of areas found to be 'suspect areas' (see Table 1) at the previous renewal survey	TM of areas found to be 'suspect areas' (see Table 1) at the previous renewal survey	As for the renewal survey, see Table 3.

Notes:

Areas 1, 4 and 6, and A – see notes to Table 4.

*) Overall survey is a survey intended to report on the overall condition of the hull structure and determine the extent of additional close-up surveys.

Table 6: Extent of TM at Renewal Survey for Tankers other than Double-Hull

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
One section of deck plating for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast)	Within the cargo area: .1 each deck plate; .2 one transverse section	Within the cargo area: .1 each deck plate; .2 two transverse sections	Within the cargo area: .1 each deck plate; .2 three transverse sections; .3 each bottom plate
Measurements of structural members subject to close-up survey for general assessment and recording of corrosion pattern	Measurements of structural members subject to close-up survey for general assessment and recording of corrosion pattern	Measurements of structural members subject to close-up survey for general assessment and recording of corrosion pattern	Measurements of structural members subject to close-up survey for general assessment and recording of corrosion pattern
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	Selected wind and water strakes outside the cargo area	Selected wind and water strakes outside the cargo area	Selected wind and water strakes outside the cargo area
		All wind and water strakes within the cargo area	All wind and water strakes within the cargo area

Notes: explanations for ‘suspect areas’ and ‘close-up survey’ – see notes to Table 1. Scope of close-up survey requirements at intermediate survey of tankers other than double-hull, see Table 7.

Table 7 – Scope of close-up survey requirements at renewal survey of tankers other than double-hull

age ≤ 5yrs	5 < age ≤ 10	10 < age ≤ 15	age > 15yrs
Complete transverse web frame ring including adjacent structural members			
One web frame ring – in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast.	All web frame rings – in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast.	All web frame rings in all ballast tanks; all web frame rings in a cargo wing tank; a minimum of 30% of all web frame rings in each remaining cargo wing tank*.	All web frame rings in all ballast tanks; all web frame rings in a cargo wing tank; a minimum of 30% of all web frame rings in each remaining cargo wing tank*. In addition, transverses are included as deemed necessary by the Administration.
Deck transverse including adjacent deck structural members			
One deck transverse in a cargo tank.	One deck transverse in a cargo tank in each of the remaining ballast tanks, if any; one deck transverse in a cargo wing tank; one deck transverse in two cargo centre tanks.		
Transverse bulkhead complete, including girder system and adjacent members			
	Both transverse bulkheads in a wing ballast tank, if any, or a cargo wing tank used primarily for water ballast.	All transverse bulkheads in all cargo and ballast tanks.	All transverse bulkheads in all cargo and ballast tanks. In addition, transverses are included as deemed necessary by the Administration.
Transverse bulkhead lower part, including girder system and adjacent members			
One transverse bulkhead in a ballast tank; one transverse bulkhead in a centre tank.	One transverse bulkhead in each remaining ballast tank; one transverse bulkhead in a cargo wing tank; one transverse bulkhead in two cargo centre tanks.		
Deck and bottom transverse including adjacent structural members (for ore/oil ships, applicable to deck transverse only)			

		A minimum of 30% of deck and bottom transverses, including adjacent structural members in each cargo centre tank	A minimum of 30% of deck and bottom transverses, including adjacent structural members in each cargo centre tank*. In addition, transverses are included as deemed necessary by the Administration
Additional complete transverse web frame ring			
		As considered necessary by the Administration	As considered necessary by the Administration

Notes:

*) the 30% should be rounded up to the next whole integer.

For ‘renewal survey’ under ESP, see note 1) to Table 2.

Thickness measurements during an annual survey are carried out when considered necessary by the surveyor. But if such TM, should they have been conducted at the discretion of the surveyor, indicated that ‘substantial corrosion’ was found, the scope of such TM should be increased as necessary, in accordance with the provisions of Annex 4 to Part B of Annex B to Resolution A.744(18) as amended (refer to A.744(18) for details).

See note 3) to Table 2 as regards substantial corrosion.

Thickness measurements during an intermediate survey are to be carried out for ‘suspect areas’ (see Note *) to Table 1), identified at the previous renewal survey.

However, TM may be dispensed with, provided that the surveyor is satisfied by the results of close-up survey, that there is no structural diminution, and the coating (where applied) remains effective. Where a protective coating in cargo holds is found in good condition (having only minor spot rusting), the extent of close-up survey and TM may be suitably reduced.