TÜRK LOYDU RULE CHANGE SUMMARY

TL NUMBER: 02/2016 JULY 2016

Latest editions of TL Rules incorporate all rule changes. The latest rule revisions of a published rule are shown with a vertical line. Changes after the publication of the rule are written in red colour.

Please note that within this document added items are written in red and for deleted items strikethrough is applied. After the publication of relevant rule, those revisions are to be indicated with a vertical line. Following Rule Changes presented in English are also implemented into Turkish Version of Rules.

RULE CHANGE SUMMARY

CLASSIFICATION AND SURVEYS	
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02	Section 3
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01	Section 1, H.6.7
02	Section 2, A.3.1 and A.3.2
03	Section 3, B.9.5
04	Section 4, C.2.5
05	Section 6, A.1
06	Section 10, A.1.2
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10	**Section 16,I**
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02	**Section 5, C.1.6**
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05	**Section 15, A.5**
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No	**Item**
01	**Chapter 35 - B, Section 4, B.2.1.6, B.2.1.7.1, B.2.2 and B.2.3**
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No	**Item**
01	**Section 7, C.10**
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02	**Section 5,C.1.6**
03	**Section 14, B.1.9 and G.8.3**
ADDITIONAL RULE – TURK LOYDU SURVEY AND CERTIFICATION RULES ON ENERGY EFFICIENCY OF SHIPS (MARPOL 73/78 ANNEX VI, CHAPTER 4)	
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01	**General**

ADDITIONAL RULE – UNIFIED INTERPRETATIONS FOR THE IMPLEMENTATION OF MARPOL ANNEX VI AND NOX TECHNICAL CODE	
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01	**General**
ADDITIONAL RULE – UNIFIED INTERPRETATIONS FOR LIFE SAVING APPLIANCES	
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01	**General**
ADDITIONAL RULE – TYPE TESTING PROCEDURE FOR CRANKCASE OIL MIST DETECTION AND ALARM EQUIPMENT	
No	**Item**
01	**General**

CLASSIFICATION AND SURVEYS

01. Section 2 - Classification

Revision Date: May 2016

Entry into Force Date: July 2016

Note in Table 2.24 is added as follows:

Class Notation	Description	Application	Rule Requirement, Design	Rule Requirement, Survey
ICE-B4	Ships with their hull and machinery complying with the requirements of **TL** rules relating to strengthening for navigation in ice **(1), (2), (3)**	Ships navigating in ice	Part A Chapter 1 Section 14	Classification and Surveys Section 3
ICE-B3				
ICE-B2				
ICE-B1				
ICE-B				

(1) *Index 4 represents the highest notation.*

(2) *Notations ICE-B4 to ICE-B1 corresponding to ice classes IA Super to IC of the Finnish/ Swedish Ice Class Rules as amended.*

(3) *Ships assigned with the class notation ICE-B are intended to navigate in light and very light localised drift ice in mouths of rivers and coastal areas.*

(4) *Class notation ICE-B may be assigned to hull and machinery installation or only to the hull on request.*

Revision Date: April 2016

Entry into Force Date: July 2016

Change of Oil Tanker/ Product Tanker notation to Crude Oil.

Table 2.7 Ship type notations for tankers, general

Class Notation	Description	Application	Rule Requirement, Design (1)	Rule Requirement, Survey
CSR	CSR class notation is assigned to ships contracted for construction on or after 1st April 2006 and complying with Rules of "IACS Common Structural Rules	CSR Oil Tankers	-CSR Part 1 and Part 2 Chapter 2 - Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 -	CSR Part 1 Chapter 13

	for Bulk Carriers and Oil Tankers" that are applied for structural design of tankers with a length of 150 m or above		Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Relevant requirements given in Part A Chapter 1 Hull that are not covered by IACS Common Structural Rules for Bulk Carriers and Oil Tankers	
OIL TANKER	Ships intended for transport of oil in bulk	Oil tankers	- Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 - Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Part A Chapter 1 Section 28	Classification and Surveys Section 3
PRODUCT TANKER	Ships intended for transport of all type of oil product in bulk except crude oil	Product Tankers	- Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 - Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Part A Chapter 1 Section 28	Classification and Surveys Section 3
~~**OIL TANKER/PRODUCT**~~ **CRUDE OIL TANKER**	Ships intended for transport of ~~oil in bulk or oil product~~ crude oil	~~Oil or Product~~ Crude OilTankers	- Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 - Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Part A Chapter 1 Section 28	Classification and Surveys Section 3
CHEMICAL TANKER TYPE 1/2/3	Ships intended for transport of all types of liquid chemicals in bulk	Chemical Tankers	- Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 - Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Part C Chapter 8	Classification and Surveys Section 3
LIQUEFIED GAS TANKER TYPE 1G/2G/2PG/ 3G	Ships intended for carriage of liquefied gas cargoes in bulk	Liquefied Gas Tankers	- Part A (Chapter 1 – Hull, Chapter 2 – Material, Chapter 3 – Welding), - Part B (Chapter 4 - Machinery, Chapter 4-1 Automation, Chapter 5 – Electrical Installations), - Part C Chapter 10	Classification and Surveys Section 3

Revision Date: April 2016

Entry into Force Date: July 2016

Additon according IACS PR 1C-Rev.04

C.

5.2.2 The class will automatically be suspended in the event that the Renewal Survey has not been completed and no postponement has been granted or is not under attendance for completion prior to resuming trading, by the due date when the 5-year Class Certificate expires or by the expiry date of any extension granted in C.2.9.

Revision Date: April 2016

Entry into Force Date: July 2016

Crude oil notation added to survey scheme

D.

2.6 Survey scheme

All oil tanker, product tanker, crude oil tanker, chemical tanker and bulk carrier (≥ 500 GT) notations are always completed by the additional class notation **ESP**, which means that the ship's hull and piping in way of cargo area is to be surveyed according to enhanced survey program (See also UR Z11).

Revision Date: March 2016

Entry into Force Date: July 2016

Client's responsibilities

A.

2.4.5 Client's responsibilities

2.4.5.1 It is the responsibility of the owner/ operator, designer, builder and the installer to familiarize themselves and to abide by the applicable TL Rules, international conventions, EU Regulations and/ or flag administration requirements and other standards applicable to the contract

Revision Date: May 2016

Entry into Force Date: July 2016

Changes according IACS PR 1A-Rev.5

B.

3.3.1.1.3 For ships of 10 years of age and above butless than 20 years of age, the survey is to include an Annual Survey and inspection of a representative number of ballast spaces and cargo holds and/or

cargo tanks, as applicable. For gas carriers, in lieu of internal inspection of cargo spaces, the following applies:

- Inspection of representative spaces surrounding cargo tanks, including external inspection of the tank and its supporting systems as far as possible;

- Review of cargo log books and operational records to verify the correct functioning of the cargo containment system.

Revision Date: May 2016

Entry into Force Date: July 2016

Explanation added to Table 2.27 Notations for survey schemes

CM-PS	For ships complying with the relevant **TL** rules with its propeller shaft runs within the stern tube in oil, the possibility exists, to prolong the intervals between shaft withdrawals		Part B Chapter 4 Machinery Section 5 C.6.6	Classification and Survey Section 3 B.4.1.1

Revision Date: January 2016

Entry into Force Date: July 2016

Amendments added to item A.2.4.2.3

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TL requires the applicable Convention Certificates to be issued by a flag state or **TL** or an organization which is authorized by the flag state. Safety Management Certificates in accordance with the provisions of the International Safety Management Code (ISM Code) may be issued by an organisation complying with IMO Resolution A.739(18) amended by Resolution MSC.208(81) and authorised by the flag state with which the ship is registered. Cargo Ship Radio Certificates may be issued by an organisation authorised by the flag state with which the ship is registered.

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Revision Date: May 2016

Entry into Force Date: July 2016

Additions according IACS PR 1A-Rev.4

B.

3.2.1.8 Additional Documents required for approval of Alternative Design and Arrangements

3.2.1.8.1 Document(s) of Approval of Alternative Design and Arrangements are to besubmitted, if any.

Revision Date: June 2016

Entry into Force Date: July 2016

Additions according IACS UR Z 26

F. ALTERNATIVE DESIGN SCHEME (ACS)

1. General

ACS is a certification scheme involving a manufacturer (and associated sub-suppliers, if needed) in the inspection, testing and certification of the manufacturer's products.

An ACS will clarify:

- The extent of the required inspection and testing.

- To which extent and under which conditions the manufacturer may perform all or parts of the required inspection and testing without the presence of a TL-Surveyor a TL-Certificate is required.

The extent to which the manufacturer is given permission to carry out inspections and testing without the presence of a Surveyor is to be agreed on a case by case basis, e.g. for a specific product production line or for specific parts.

2. Scope

1. An ACS may be arranged with product manufacturers and/or sub-suppliers.

2. An ACS with a manufacturer must define the handling of subcontracted parts (those that require TL or work certificates or in any other way are addressed in the Rules).

The sub-supplier may be included in the ACS of the manufacturer or have his own ACS or deliver parts that are inspected and certified by TL.

3. An ACS that permits the manufacturer to carry out all or parts of required inspection and testing without the presence of a Surveyor may be arranged in two versions with regard to traceability:

- The ACS describes inspection, testing and certification additional to the manufacturer's standard quality control in order to meet the Rules. The components are to be stamped with a special stamp supplied by

TL or identified as required by TL.

- The manufacturer has a standard quality control that covers all required inspection, testing and certification in compliance with the Rules. Traceability and the required type of product document for components or products will be defined in the ACS.

3. Conditions

3.1 The conditions for the manufacturer to be granted the permission to carry out inspection and testing without the presence of a Surveyor are that:

- The manufacturer has an implemented Quality System according to a national or international Standard approved by an accredited certification body or recognised by TL.

- The manufacturer has a quality control system, current drawings, and Rules and standards that cover the product to be certified.

- The inspection and testing required by the Rules are either standard procedures in the Quality System and recognized by TL or specified in detail in the ACS.

- TL initially ascertains the manufacturer's compliance with the ACS requirements by verifying the required product and process approvals and performing an initial audit. Follow-up and renewal audits are conducted by TL on a regular basis to verify that conditions of the ACS are continuously maintained by the manufacturer.

- If work certificates (W) or test reports (TR) are found not to fulfill the standards agreed with TL, the component may not be accepted.

- The agreed ACS may be suspended or cancelled when / if found justified by TL.

- TL may carry out unscheduled inspections at the manufacturer and/or subcontractor at its own discretion.

- The manufacturers (and designers, if producing under license) commit themselves to involve TL when changes to the design, manufacturing process or testing are made as well as when any major production problems or any major product delivery problems have occurred.

- The validity of an ACS is to be a maximum of 5 years. The ACS may be renewed subject to an audit. The scope of the renewal audit shall:

- verify the conditions of the ACS are still met

- verify that the current products and processes are appropriately controlled

4. Information to be submitted

4.1 For admission to an alternative certification scheme for a product, the manufacturer is to submit an application enclosing the following documentation:

- Product details.

- Existing class approvals of the manufacturer's products as far as required.

- The procedures relevant to the manufacturing process.

- A list of material suppliers with an indication of their class approval (as far as required by the Rules) and the type of material certification in each case.

- Quality control plans relevant to the products and relevant components to be certified through the alternative certification scheme. Said plans are to detail the inspections and tests required by the Rules with an indication of which inspections and tests are delegated to the manufacturer and which are to be done in the presence of a TL-surveyor.

- The procedures relevant to the quality control and inspections, their methods, frequency and certification.

- The list of suppliers of materials and main components of the product, including certificates.

- The quality system details.

- List of nominated personnel for:

  - Marking/stamping of products

  - Tests and Inspection (responsible)

  - Provision of data and information (e.g. declaration of conformity, test reports etc.)

  - Any other additional documents that TL may require in order to evaluate the manufacturing processes and product quality control.

5. Audit procedure

5.1 Upon satisfactory examination of the complete documentation for application an initial audit shall be carried out at the manufacturer's works. This audit is to verify that the manufacture of the product and the relevant controls are performed in accordance with the documents submitted and are in compliance with the requirements laid down in the ACS documentation and the TL Rules.

5.2 Upon satisfactory outcome of the audits, the extent, duration and conditions of the ACS are documented.

5.3 At least one intermediate audit during the period of validity of the ACS is to be carried out. Additional audits may be required at the discretion of TL

02. Section 3 - Surveys

Revision Date: November 2015

Entry into Force Date: July 2016

According to Rec.143, a note is added under item F.1.1.2.15 as follows:

Note: Refer to IACS Rec No.143 for Recommended procedure for the determination of contents of metals and other contaminants in a closed fresh water system lubricated stern tube.

Revision Date: May 2016

Entry into Force Date: July 2016

Additions according IACS UR Z18 – Rev.04 and Rev.05

A.

4.10.3 Internal inspection

Steam boilers are to be subjected to an internal survey twice in every 5-year class period. The first internal survey has to be carried out on the occasion of the 2nd but not later than the 3rd regular annual survey. The maximum interval between internal surveys should not exceed 3 years. An extension of examination of the boiler of up to 3 months beyond the due date can be granted in exceptional circumstances. For "exceptional circumstances" refer to Sec. 2, C For ships with one main boiler only, internal inspections are to be performed every 2.5 years until 10 years after commissioning and every year thereafter. Boiler installations with only one main boiler and one auxiliary boiler powerful enough to operate the propulsion plant in an emergency (take-home boiler), count as multi-boiler plants.

4.10.4 An extension may be granted by **TL** on the basis of "G.2 - Internal Inspection", after the following is satisfactoriliy carried out:

Revision Date: May 2016

Entry into Force Date: July 2016

Additions according IACS UR Z7 – Rev 12 and Rev.23

A.

8.5 When thickness measurements are specified by the rules or required by the surveyor, the measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels.

Thickness measurements are carried out by a qualified company approved by **TL** and witnessed by the surveyor.

In any kind of survey, i.e. class renewal, intermediate, annual or other surveys having the scope of the foregoing ones, thickness measurements, when required in general by Table 3.3 or according to ship type by Table 3.6, Table 3.26, Table 3.10, Table 3.13, Table 3.18, Table 3.23, Table 3.17 of structures in areas where close-up surveys are required, shall be carried out simultaneously with close-up surveys.

For structure built with a material other than steel, alternative thickness measurement requirements may be developed and applied as deemed necessary by **TL.**

Revision Date: May 2016

Entry into Force Date: July 2016

Additions according IACS UR Z10.2– Rev.32

D.

2.4.2.7 Close-up survey and thickness measurement (Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness measurement shall be done of accessible parts of hatch covers structures) of the hatch cover and coaming plating and stiffeners is to be carried out as given in Table 3.9 and Table 3.10.

Revision Date: May 2016

Entry into Force Date: July 2016

D.

Additions according IACS UR Z7– Rev.22, UR Z7.1-Rev.01

2.1.1

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Hatch covers and coamings are to be surveyed as follows:

- A thorough inspection of the items listed in B, 3 for hatch covers and coamings, including close-up survey of hatch cover plating and hatch coaming plating, are to be carried out. Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey shall be done of accessible parts of hatch covers structures.

2.3.3 Hatch covers and coamings

Close-up survey and thickness measurements of the hatch cover and coaming plating and stiffeners is to be carried out as given in Table 3.6 and Table 3.7

Table 3.3 Minimum requirements for thickness measurements at class renewal survey

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.	1) Suspect areas throughout the vessel.
	2) One transverse section of deck plating in way of a cargo space within the amidships 0.5 L.	2) Two transverse sections within the amidships 0.5 L in way of two different cargo spaces.	2) A minimum of three transverse sections in way of cargo spaces within the amidships 0.5 L.
		3) All cargo holds hatch covers and coamings (plating and stiffeners).	3) All cargo holds hatch covers and coamings (plating and stiffeners).
		4) Internals in forepeak and after peak tanks.	4) Internals in forepeak and after peak tanks.

			5) All exposed main deck plating full length.
			6) Representative exposed superstructure deck plating (poop, bridge and forecastle deck).
			7) Lowest strake and strakes in way of tween decks of all transverse bulkheads in cargo spaces together with internals in way.
			8) All wind-and-water strakes, port and starboard, full length.
			9) All keel plates full length. Also, additional bottom plates in way of cofferdams, machinery space and aft end of tanks.
			10) Plating of sea chests. Shell plating in way of overboard discharges as considered necessary by the attending surveyor.

Notes:

1. *Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.*

2. *Thickness measurements of internals may be specially considered by the surveyor if the hard protective coating is in good condition.*

3. *For ships less than 100 m. in length, the number of transverse sections required at class renewal survey no.3 may be reduced to one (1), and the number of transverse sections required at subsequent class renewal surveys may be reduced to two (2).*

4. *For ships more than 100 m. in length, at class renewal survey no. 3, thickness measurements of exposed deck plating within amidships 0.5 L may be required.*

5. *Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, thickness measurement shall be done of accessible parts of hatch covers structures.*

Table 3.7 Minimum requirements for close-up survey at hull class renewal surveys of general dry cargo ships

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
(A) Selected shell frames in one forward and one aft cargo hold and	**(A)** Selected shell frames in all cargo holds and tween deck spaces.	**(A)** All shell frames in the forward lower cargo hold and 25% frames in each of	**(A)** All shell frames in all cargo holds and tween deck spaces

associated tween deck spaces. **(B)** One selected cargo hold transverse bulkhead. **(D)** All cargo holds hatch covers and coamings (plating and stiffeners).	**(B)** One transverse bulkhead in each cargo hold. **(B)** Forward and aft transverse bulkhead in one side ballast tank, including stiffening system. **(C)** One transverse webs with associated plating and framing in two representatives water ballast tanks of each type (i.e. topside, hopper side, side tank or double bottom tank). **(D)** All cargo hold hatch covers and coamings (plating and stiffeners). **(E)** Selected areas of all deck plating and under deck structure inside line of hatch openings between cargo hold hatches. **(F)** Selected areas of inner bottom plating.	the remaining cargo holds and tween deck spaces including upper and lower end attachments and adjacent shell plating. **(B)** All cargo holds transverse bulkheads. **(B)** All transverse bulkheads in ballast tanks, including stiffening system. **(C)** All transverse webs with associated plating and framing in each water ballast tank. **(D)** All cargo hold hatch covers and coamings (plating and stiffeners). **(E)** All deck plating and under deck structure inside line of hatch openings between cargo hold hatches. **(F)** All areas of inner bottom plating.	including upper and lower end attachments and adjacent shell plating. Areas **(B-F)** as for Class Renewal Survey No.3.

(A) *Cargo hold transverse frames.*

(B) *Cargo hold transverse bulkhead plating, stiffeners and girders.*

(C) *Transverse web frame or watertight transverse bulkhead in water ballast tanks.*

(D) *Cargo hold hatch covers and coamings. Subject cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/ thickness measurement shall be done of accessible parts of hatch covers structures.*

(E) *Deck plating and under deck structure inside line of hatch openings between cargo hold hatches.*

(F) *Inner bottom plating.*

***Note**: Close-up survey of cargo hold transverse bulkheads to be carried out at the following levels:*

- *Immediately above the inner bottom and immediately above the tween decks, as applicable.*
- *Mid-height of the bulkheads for holds without tween decks.*
- *Immediately below the main deck plating and tween deck plating.*

2.4.2.7 Close-up survey and thickness measurement (Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness

measurement shall be done of accessible parts of hatch covers structures) of the hatch cover and coaming plating and stiffeners is to be carried out as given in Table 3.9 and Table 3.10.

2.5.1.5 Close-up survey and thickness measurement (Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness measurement shall be done of accessible parts of hatch covers structures) of the hatch cover and coaming plating and stiffeners is to be carried out as given in Table 3.12 (Sheet 1 and Sheet 2) and Table 3.13.

Table 3.13 Minimum requirements for the thickness measurements at hull class renewal surveys of double skin bulk carriers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.
	Within the cargo length: Two transverse sections of deck plating outside line of cargo hatch openings.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Two transverse sections, one in the amidship area, outside line of cargo hatch opening. - All wind and water strakes.	Within the cargo length: - Each deck plate outside line of cargo hatch opening - Three transverse sections, one in the amidship area, outside line of cargo hatch opening. - Each bottom plate.
	Wind and water strakes in way of the two transverse sections considered above. Selected wind and water strakes outside the cargo length area.	Selected wind and water strakes outside the cargo length area.	All wind and water strakes, full length.
	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12/ Sheet 1 or Table 3.12/ Sheet 2, as	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12/ Sheet 1 or Table 3.12/ Sheet 2, as	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.12/ Sheet 1 or Table 3.12/ Sheet 2, as

	applicable.	applicable.	applicable.

2.6.1.8.1

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Cargo tank testing carried out by the vessel's crew under the direction of the Master may be accepted by the surveyor provided the following conditions are complied with:

– a tank testing procedure, specifying fill heights, tanks being filled and bulkheads being tested, has been submitted by the owner and reviewed by **TL** prior to the testing being carried out; there is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank;

Table 3.9 Minimum requirement for close-up survey at hull class renewal surveys of single skin bulk carriers

Class renewal survey No.1 Age ≤ 5	**Class renewal survey No.2 5 < Age ≤ 10**	**Class renewal survey No.3 10 < Age ≤ 15**	**Class renewal survey No.4 and subsequent 15 < Age**
(A) 25% of shell frames in the forward cargo hold at representative positions. **(A)** Selected frames in remaining cargo holds. **(B)** One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type (i.e. topside, or hopper side tank). **(C)** Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(D)** All cargo hold hatch covers and coamings (plating and stiffeners).	**(A)** All shell frames in the forward cargo hold and 25% of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. For bulk carriers 100.000 dwt and above, all shell frames in the forward cargo hold and 50% of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. **(B)** One transverse web with associated plating and longitudinals in each water ballast tank. **(B)** Forward and aft transverse bulkhead in one ballast tank, including stiffening	**(A)** All shell frames in the forward and one other selected cargo hold and 50% of frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. **(B)** All transverse webs with associated plating and longitudinals in each water ballast tank. **(B)** All transverse bulkheads in ballast tanks, including stiffening system. Areas **(C)**, **(D)** and **(E)** as for class renewal survey No.2.	**(A)** All shell frames in all cargo holds including upper and lower end attachments and adjacent shell plating. Areas **(B) - (E)** as for class renewal survey No. 3.

	system. **(C)** All cargo holds transverse bulkheads, including internal structure of upper and lower stools, where fitted. **(D)** All cargo hold hatch covers and coamings (plating and stiffeners) **(E)** All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches.		

(A) *Cargo hold transverse frames.*
(B) *Transverse web frame or watertight transverse bulkhead in water ballast tanks.*
(C) *Cargo hold transverse bulkhead plating, stiffeners and girders.*
(D) *Cargo hold hatch covers and coamings.Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness measurement shall be done of accessible parts of hatch covers structures.*
(E) *Deck plating and under deck structure inside line of hatch openings between cargo hold hatches.*

Note: *Close-up survey of transverse bulkheads to be carried out at four levels:*
Level (a) *Immediately above the inner bottom and immediately above the line of gusset (if fitted) and shedders for ships without lower stool.*
Level (b) *Immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates.*
Level (c) *About mid-height of the bulkhead.*
Level (d) *Immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks.*

2.6.2.7.1 The minimum requirements for ballast tank testing at class renewal survey are given in 2.6.1.8.3 and Table 3.21. The minimum requirements for cargo tank testing at class renewal survey are given in 2.6.1.8.4 and Table 3.21. Cargo tank testing carried out by the vessel's crew under the direction of the Master may be accepted by the surveyor provided the following conditions are complied with:

- tank testing procedure specifying fill heights, tanks being filled and bulkheads being tested, has been submitted by the owner and reviewed by **TL** prior to the testing being carried out;

Table 3.23 Minimum requirements for the thickness measurements at hull class renewal surveys of chemical tankers

Class renewal survey No.1 Age ≤ 5	Class renewal survey No.2 5 < Age ≤ 10	Class renewal survey No.3 10 < Age ≤ 15	Class renewal survey No.4 and subsequent 15 < Age
Suspect areas.	Suspect areas.	Suspect areas.	Suspect areas.

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: - Each deck plate - One transverse section	Within the cargo area: - Each deck plate - Two transverse sections **(1)** - All wind and water strakes.	Within the cargo area: - Each deck plate - Three transverse sections **(1)** - Each bottom plate.
	Selected wind and water strakes outside the cargo area.	Selected wind and water strakes outside the cargo area.	All wind and water strakes, full length.
Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22, Sheet 1 or Sheet 2, as applicable.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22, Sheet 1 or Sheet 2, as applicable.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22, Sheet 1 or Sheet 2, as applicable.	Measurements for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table 3.22, Sheet 1 or Sheet 2, as applicable.
(1) *At least one section is to include a ballast tank within 0.5 L amidships.*			

Revision Date: June 2016

Entry into Force Date: July 2016

Rec.144 New has been incorporated into TL Classification and Surveys Rule, Section 03, Item D.2.1.1 as follows:

2.1.1 The survey is to cover the following items:

...

All ship side valves, i.e. all suction and discharge valves, should be opened up and examined at least once in a class renewal survey period period.

Upon re-assembly the valves should be tested to confirm:

- satisfactory operation of the valves and their actuating mechanisms;
- full closing of the valve;
- tightness of the valve when fully seated.

Testing of actuating mechanisms should include the testing of any remote controls e.g. extended spindles, rod gearing. If the operation of the actuating mechanism is not satisfactory, the mechanism should be further examined to determine the cause, which may include the stripping and opening out of the mechanism as deemed necessary.

Revision Date: March 2016

Entry into Force Date: July 2016

Alternative Means for shafting arrangement according changed according IACS UR Z21-Rev.04

F.

1.1.2.19 Alternative Means

Shafting arrangements such as, but not limited to, an approved Condition Monitoring Scheme and/ or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods as applicable in Section 3, F.

Revision Date: February 2016

Entry into Force Date: July 2016

Header changed according IACS Recommendation No. 140

I. Survey and Testing of Pressurized Systems

Revision Date: April 2016

Entry into Force Date: July 2016

Shaft survey intervals

K.

1.4.1 Survey intervals

1.4.1.1 For Survey intervals and Survey methods, the requirements provided in Section 3, F are to be applied.

1.4.2 Survey methods

1.4.2.1 Survey methods are as described in F.

1.5 Class extension surveys

1.5.1 Class extension surveys are as described in F.

PART A – CHAPTER 1 – HULL

01. Section 1 – General, Definitions

Revision Date: June 2016

Entry into Force Date: July 2016

Item H.6.7 has been revised as follows:

6.7 For the arrangement of hatches, doors and ventilators the following areas are defined:

Position 1

- On exposed freeboard decks,
- On raised quarter decks,
- On the first exposed superstructure decks above the freeboard deck within the forward quarter of $\mathbf{L_c}$.

Position 2

- On exposed superstructure decks aft of the forward quarter of $\mathbf{L_c}$ located at least one standard height of superstructure above the freeboard deck.
- On exposed superstructure decks within the forward quarter of $\mathbf{L_c}$ located at least two standard heights of superstructure above the freeboard deck.

02. Section 2 - Habitability

Revision Date: January 2016

Entry into Force Date: July 2016

Items A.3.1 and A.3.2 have been revised as follows:

…

3.1 This rules does not apply to;

- Ships of less than 500 ~~1000~~ GT;

…

3.2 Provided that the rules shall be applied where reasonable and practicable to;

- Tugs,
- Ships between 200 and 500 ~~1000~~ GT,

03. Section 3 – Design Principles

Revision Date: June 2016

Entry into Force Date: July 2016

Item B.9.5 has been added as follows:

9.5 Corrosion additions for container ships with a length L of 90 m and greater and operated in unrestricted service are to be determined according to Additional Rules for Longitudinal Strength Assessment of Container Ships.

Item I has been added in accordance to UR S11A.

Revision Date: June 2016

Entry into Force Date: July 2016

Section 5 has been generally revised according to UR S21A Rev.1

04. Section 4– Direct Strength Calculations

Revision Date: June 2016

Entry into Force Date: July 2016

Item C.2.5 has been added as follows:

2.5 Load cases for container ships with a length L of 150 m and greater are to be determined according to Additional Rule for Longitudinal Strength Assessment of Container Ships, F

05. Section 6 – Longitudinal Strength

Revision Date: June 2016

Entry into Force Date: July 2016

Item A.1 has been revised in accordance with UR S11 Rev.8 as follows:

1. Scope

1.1 In this section rules related to longitudinal strength calculations are given.

1.2 For ships of length 65 m and or above (ships in category I-II as defined in H,1.3), the scantlings of longitudinal hull structure are determined on the basis of longitudinal calculations.

For ships of length 65 m below, the minimum midship section modulus according to C.2 is to be fulfilled.

1.3 Longitudinal strength calculations presented in this section do not apply to ships with any of the following characteristics:

- unusual type or design
- unusual form (e.g. $L/B \leq 5$, $B/H \geq 2.5$, $L \geq 500$ m, $C_B < 0.6$)
- ships with large deck openings

- ships with large bow and stern flare and cargo on deck in these areas
- carriage of heated cargoes
- $V \geq 1.6\sqrt{L}$ [knots]

For ships having one or more characteristics above **TL** may require determination of wave bending moments as well as their distribution over the ship's length by approved calculation procedures. Such calculation procedures must take into account heaving and pitching motions in a natural seaway.

1.4 For bulk carriers with notation **BC-A**, **BC-B** or **BC-C** (refer to Classification and Survey Rules for definition of these notations) these rules are to be complied with by ships contracted for construction on or after 1 July 2003. For other ships, these rules are to be complied with by ships contracted for construction on or after 1 July 2004.

These rules do not apply to CSR Bulk Carriers and Oil Tankers or to container ships to which item I is applicable.

06. Section 10 – Stern Frame

Revision Date: January 2016

Entry into Force Date: July 2016

Formula in item B.1.2 and B.4.6 have been revised as follows:

1.2 The following value is recommended for the propeller clearance d0,9 related to 0.9 R (see Figure 10.1):

$$d_{0.9} \geq 0{,}004 \cdot n \cdot d_p^3 \sqrt{\frac{V\left[1-\sin(0.75\cdot\gamma)\right](0.5+\frac{z_B}{x_F})}{D}} \text{ [m]}$$

…

4.6 When determining the thickness of the rudder horn plating the provisions of 5.2 - 5.4 are to be complied with

Revision Date: June 2016

Entry into Force Date: July 2016

Section 10 has been generally revised according to UR S10 Rev.4

07. Section 13 – Superstructures and Deckhouses

Revision Date: June 2016

Entry into Force Date: July 2016

Item B.1.1 and C.2.1 have been revised as follows:

1.1 The thickness of the side plating of non-effective superstructures above the strength deck is not to be less than the greater of the following values:

$t = 1.21 s\sqrt{Pk} + t_K$ [mm] , or

$t = 0.8 t_{min}$ [mm]

For ships engaged in sheltered water service (assigned with **K6**, **L1** and **L2**) **t** is not to be less than 3,5 mm.

...

2.1 The thickness of deck plating is not to be less than the greater of the following values:

...

For the 4th tier P_{Amin} is to be taken as 12.5 kN/m^2, for the 5th tier and all following ones P_{Amin} is to be taken as 8.5 kN/m^2.

08. Section 14 – Ice Strenghtening

Revision Date: May 2016

Entry into Force Date: July 2016

Section 14 has been generally revised in accordance with Finnish-Swedish Ice Class Rules 2010.

09. Section 15 – Hatchways

Revision Date: March 2016

Entry into Force Date: July 2016

Several mistypes are corrected.

A

2.3.3 For hatch covers the requirements of Section 15,C, Section 16,G, and Section 15, D apply.

B

2.1.4 The vertical design load p_H shall in no case be less than the deck design load p_{WD} according to Section 5, D.4. Instead of the deck height z the height of hatch cover plating above baseline is then to be inserted.

5.1.1 Top plating

The thickness of the hatch cover top plating is to be obtained from the calculation according to 4. Under consideration of permissible stresses according to 3.1.

However, the thickness shall not be less than the largest of t_1, t_2 or t_{min}:

$$t_1 = 16.2 \cdot C_P \cdot a \cdot \sqrt{\frac{p}{R_{eH}}} + t_k \quad [mm]$$

$$t_2 = 10 \cdot a + t_k \quad [mm]$$

$$t_{min} = 6.0 + t_k \quad [mm]$$

For p = Vertical design load p_H or cargo load $P_{SC} + P_{DC}$;

$$C_P = 1.5 + 2.5 \cdot \left(\frac{|\sigma|}{R_{eH}} - 0.64\right) \geq 1.5$$

For p from deck design load P_{WD} or liquid pressure P_T (See A.3);

$$C_P = 1.0 + 2.5 \cdot \left(\frac{|\sigma|}{R_{eH}} - 0.64\right) \geq 1.0$$

Revision Date: June 2016

Entry into Force Date: July 2016

Section 15 has been generally revised according to UR S21A Rev.1

10. Section 16 – Hull Outfitting

Revision Date: April 2016

Entry into Force Date: July 2016

Item I has been added as follows:

I. BOLTED CONNECTIONS

Bolted connections are generally to be in accordance with Table 16.9

Table 16.9 Bolt pitch requirements for structural connections

Location	Distance between bolts
Manhole covers to fuel tanks	$5d_b$
Manhole covers to water tanks	$5d_b$
Covers over void tanks/ cofferdams	$10d_b$
Unstiffened portable plates in decks	$5d_b$
Bolted watertight door frames	$8d_b$
Window frames to superstructure	$20d_b$
d_b is the bolt diameter.	

11. Section 18 – Rudder and Manoeuvring Arrangement

Revision Date: June 2016

Entry into Force Date: July 2016

Section 18 has been generally revised according to UR S10 Rev.4 and UR S10 Rev.4 Corr.1.

12. Section 21 – Structural Fire Protection

Revision Date: March 2016

Entry into Force Date: July 2016

Item B.2.5 has been revised as follows:

2.5 Extent of main vertical zone and horizontal zone

…

The number of main vertical zones of 48 m length is not limited as long as they comply with all the requirements. See also MSC Circ.1120 amended by MSC1. Circ 1436.

Item E.2.1.1 has been revised as follows:

2.1.1

…

Pump-rooms intended solely for ballast transfer need not comply with the requirements of Chapter 4 Machinery Section 20 C.7. The requirements of Chapter 4 Machinery Section 20 C.7 are only applicable to the pump-rooms, regardless of their location, where pumps for cargo, such as cargo pumps, stripping pumps, pumps for slop tanks, pumps for COW or similar pumps are provided (Refer also to MSC/Circ.1037 and MSC/Circ.1120 amended by MSC1. Circ 1436).

…

Revision Date: March 2016

Entry into Force Date: July 2016

Item A.1.1 has been revised as follows:

1.1 The requirements of this Section are divided into two parts. Basic requirements according to B. and some parts of C., which are determined case by case between the Naval Authority and the shipyard and agreed by TL, apply to all classified naval ships. In case the class notation **SFP** is granted, all additional requirements according to C. are to be complied with.

Item C.1.1 has been revised as follows:

1. General

The requirements of C. are additional to those of B. They are based on relevant experience and international regulations, but their use is optional in accordance with the intentions of the Naval Authority and if fully met, the Class Notation **SFP** (structural fire protection) will be granted. The requirements of C. take precedence over B. For ships without SFP refer to A.1.1.

Revision Date: June 2016

Entry into Force Date: July 2016

Item B.12.11.2 and B.18.3.2 have been revised in accordance with UI SC148 as follows:

12.11.2 In passenger ships carrying more than 36 passengers, power ventilation, except machinery space and cargo space ventilation and any alternative system which may be required under item B.12.9 shall be fitted with controls so grouped that all fans may be stopped from either of two separate positions which are to be situated as far apart as practicable. Fans serving power ventilation systems to cargo spaces are to be capable of being stopped from a safe position outside such spaces.

Note: The fan in a HVAC temperature control unit, or a circulation fan inside a cabinet/switchboard, is not considered to be a ventilation fan as addressed in item B.12.11.1, B.12.11.2 and B.18.3.2.1, if it is not capable of supplying outside air to the space when the power ventilation is shut down.

Therefore, such fans need not be capable of being stopped from an easily accessible position (or a safe position) outside the space being served when applying items B.12.11.1 or B.12.11.2, and need not be capable of being controlled from a continuously manned central control station for passenger ships carrying more than 36 passengers when applying item B.18.3.2.1.

...

18.3.2 Requirements for passenger ships carrying more than 36 passengers

18.3.2.1 Passenger ships carrying more than 36 passengers shall have the fire detection alarms for the systems required by item 18.3.2.2 centralized in a continuosly manned central control station. In addition, controls for remote closing of the fire doors and shutting down the ventilation fans shall be centralized in the same location. The ventilation fans shall be capable of reactivation by the crew at the continuously manned control station. The control panels in the central control station shall be capable of indicating open or closed positions of fire doors and closed or off status the detectors, alarms and fans. The control panel shall be continuously powered and shall have an automatic change-over to standby power supply in case of loss of normal power supply. The control panel shall be powered from the main source of electrical power and the emergency source of electrical power defined by Part B, Chapter 5, Electrical Installations Rules, Section 3, C unless other arrangements are permitted by the rules, as applicable. (See also the note under item **B.12.11.2**)

18.3.2.2 A fixed fire detection and fire alarm system are to be so installed and arranged as to provide smoke detection in service spaces, control stations and accommodation spaces, including corridors, stairways and escape routes within accommodation spaces…

Revision Date: February 2016

Entry into Force Date: July 2016

Items B.17.2.2, B.17.2.3 and B.17.2.5 have been revised in accordance with UI SC276 as follows:

17.2.2 Escape from spaces below the bulkhead deck

Note: For application of items 17.2.2.1 and 17.2.2.2, see UI SC276.

Where the space is below the bulkhead deck, the two means of escape are to consist of either:

17.2.3 Escape from spaces above the bulkhead deck

Where the space is above the bulkhead deck, two means of escape are to be as widely separated as possible and the doors leading from such means of escape are to be in a position from which access is provided to the appropriate lifeboat and liferaft embarkation decks. Where such escapes require the use of ladders these are to be of steel.

Note: For application of items 17.2.3, see UI SC276.

17.2.5 Escape from machinery control rooms

Two means of escape are to be provided from a machinery control room within a machinery space, at least one of which is to provide continuous fire shelter to a safe position outside the machinery space.

Note: For application of items 17.2.5, see UI SC276.

Revision Date: February 2016

Entry into Force Date: July 2016

A reference has been given from C.11.1.2 and a footnote has been added in accordance with UI SC278 as follows:

11.1.2 Escape from spaces below the lowest open deck(22)

…

(22) *The "lowest open deck" shall be a category (10) "Open deck" (as defined in SOLAS chapter II-2, regulations 9.2.3.3.2.2 and 9.2.4.2.2.2) at the lowest height from baseline in way of accommodation spaces.*

Revision Date: February 2016

Entry into Force Date: July 2016

Item C.11.2.2 has been revised in accordance with UI SC277 as follows:

11.2.2 Escape from machinery spaces of category A

Note: For application of items 11.2.2.1 and 11.2.2.2 see, UI SC277.

...

Revision Date: March 2016

Entry into Force Date: July 2016

Item C.11.2.4 has been revised in accordance with UI SC269 and UI SC277 as follows:

11.2.4 Escape from machinery spaces other than those of category A

From machinery spaces other than those of category A, two escape routes are to be provided except that a single escape route may be accepted for spaces that are entered only occasionally and for spaces where the maximum travel distance to the door is 5 m. or less.

Steering gear spaces which do not contain the emergency steering position need only have one means of escape.

Steering gear spaces containing the emergency steering position can have one means of escape provided it leads directly onto the open deck. Otherwise, two means of escape are to be provided but they do not need to lead directly onto the open deck.**(23)**

---

(23) *Escape routes that pass only through stairways and/or corridors that have fire integrity protection equivalent to steering gear spaces are considered as providing a "direct access to the open deck".*

Note: For application of item 11.2.4, see UI SC277.

13. Section 26 – Stability

Revision Date: March 2016

Entry into Force Date: July 2016

Item B.1.1.9.1 has been revised as follows:

1.1.9.1 Supply vessels with the length 24 m < L< 100 m are to comply with the requirements specified in Chapter 3 of Guidelines for the Design and Construction of Offshore Supply Vessels, introduced by IMO Resolution MSC.235(82) amended by Resolution MSC.335(90).

14. Section 28 – Oil Tankers

Revision Date: May 2016

Entry into Force Date: July 2016

Items C.1.4.2 is revised as follows;

...

Accommodation spaces, main cargo control spaces, control stations and service spaces are to be arranged in such a way that a single failure of a deck or bulkhead will not permit the entry of gas or fumes from the cargo tanks or slop tanks into such spaces. In addition, where deemed necessary for the safety or navigation of the ship, machinery spaces of category A containing internal combustion machinerynot being main propulsion machinery having an output greater than 375 kW may be permitted to be located forward of the cargo area provided the arrangements are in accordance with the provisions of this paragraph.

Revision Date: June 2016

Entry into Force Date: July 2016

Items C.2.1.5-2.1.6 have been added according to MARPOL 73/78 Annex I Reg. 18 and UI MPC5 Rev.1 as follows:

2.1.5 Notwithstanding the provisions of item 2.1.2 the segregated ballast conditions for oil tankers less than 150 metres in length shall be to the satisfaction of the Administration*.

2.1.6 In every crude oil tanker of 20,000 dwt and above and every product carrier of 30,000 dwt and above delivered after 1 June 1982, as defined in Marpol Annex I regulation 1.28.4, except those defined in item 2.2, the segregated ballast tanks required to provide the capacity to comply with the requirements of item 2.1.2, which are located within the cargo tank length, shall be arranged in accordance with the requirements of items 2.1.6.1, 2.1.6.2 and 2.1.6.3 to provide a measure of protection against oil outflow in the event of grounding or collision.

2.1.6.1 Segregated ballast tanks and spaces other than oil tanks within the cargo tanks length (Lt) shall be so arranged as to comply with the following requirement:

$\Sigma PA\ c + \Sigma PA\ s \geq J\ [Lt\ (B + 2D)]$

* Marpol Annex I - Appendix 1 - Guidance to Administrations concerning draughts recommended for segregated ballast tankers below 150 m in length

PAc :the side shell area in square metres for each segregated ballast tank or space other than an oil tank based on projected moulded dimensions,

PAs :the bottom shell area in square metres for each such tank or space based on projected moulded dimensions,

L_t :length in metres between the forward and after extremities of the cargo tanks,

D :moulded depth in metres measured vertically from the top of the keel to the top of the freeboard deck beam at side amidships. In ships having rounded gunwales, the moulded depth shall

be measured to the point of intersection of the moulded lines of the deck and side shell plating, the lines extending as though the gunwale were of angular design,

J :0.45 for oil tankers of 20,000 tonnes deadweight, 0.30 for oil tankers of 200,000 tonnes deadweight and above, subject to the provisions of Item 2.1.6.2.

:For intermediate values of deadweight the value of J shall be determined by linear interpolation.

Whenever symbols given in this paragraph appear in this regulation, they have the meaning as defined in this paragraph.

2.1.6.2 For tankers of 200,000 tonnes deadweight and above the value of J may be reduced as follows:

$$J_{reduced} = \left[J - \left(a - \frac{O_C + O_S}{4O_A}\right)\right] \text{ or } 0.2$$

whichever is greater

where:

a = 0.25 for oil tankers of 200,000 tonnes deadweight,

= 0.40 for oil tankers of 300,000 tonnes deadweight,

= 0.50 for oil tankers of 420,000 tonnes deadweight and above.

= For intermediate values of deadweight the value of a shall be determined by linear interpolation.

O_C = The hypothetical outflow of oil in the case of side damage as defined in arpol Annex I regulation 25.1.1,

O_S = The hypothetical outflow of oil in the case of bottom damage as defined in Marpol Annex I regulation 25.1.2,

O_A = the allowable oil outflow as required by Marpol Annex I regulation 26.2 of this Annex.

2.1.6.3 In the determination of PAc and PAs for segregated ballast tanks and spaces other than oil tanks the following shall apply:

2.1.6.3.1 The minimum width of each wing tank or space either of which extends for the full depth of the ship's side or from the deck to the top of the double bottom shall be not less than 2 metres. The width shall be measured inboard from the ship's side at right angles to the centreline. Where a lesser width is provided the wing tank or space shall not be taken into account when calculating the protecting area PAc; and

2.1.6.3.1.2 the minimum vertical depth of each double bottom tank or space shall be B/15 or 2 metres, whichever is the lesser. Where a lesser depth is provided the bottom tank or space shall not be taken into account when calculating the protecting area PAs.

For the purpose of determining the minimum vertical depth of each double bottom tank or space to be taken into account when calculating the protecting area PAs, suction wells may be neglected, provided such wells are not excessive in area and extend below the cargo tank for a minimum distance and in no case more than half the height of the double bottom.

The minimum width and depth of wing tanks and double bottom tanks shall be measured clear of the bilge area and, in the case of minimum width, shall be measured clear of any rounded gunwale area.

Item C.2.2.2.1.3 has been revised according to UI MPC9 Rev.1 as follows:

2.2.2.1.3 Turn of the bilge area

For turn of the bilge area or at locations without a clearly defined turn of the bilge, when the distances h and w are different, the distance w is to have preference at levels exceeding 1.5 h above the baseline as shown in Figure 28.2.

Note: *The requirement above for turn of the bilge areas as shown in Figure 28.2 is applicable throughout the entire tank length.*

PART A – CHAPTER 2 – MATERIAL

01. Section 14 – Fittings and Pressed Parts, Bolts and Nuts

Revision Date: June 2016

Entry into Force Date: July 2016

Section 14 has been added on Material Rules.

PART B – CHAPTER 4 - MACHINERY

01. Section 1 - General Rules and Instructions

Revision Date: January 2016

Entry into Force Date: July 2016

Item A.1.8 and A.1.9 have been revised according to latest revision on IMO documents as follows:

1.8 ~~All passenger ships shall comply with TL guideline "Qualitative Failure Analysis for Propulsion and Steering on Passenger Ships".~~ Passenger ships having a length of 120 m or more or having three or more main vertical fire zones shall also comply with MSC.216 (82) and MSC.1/1369~~1214~~ **(1)**.

1.9 All passenger ships shall comply with TL additional rule "Qualitative Failure Analysis for Propulsion and Steering on Passenger Ships".

02. Section 2 - Internal Combustion Engines and Air Compressors

Revision Date: May 2016

Entry into Force Date: July 2016

Section 2, has been generally revised according to deleted IACS Unified Requirements (UR M5, UR M6, UR M14, UR M18, UR M19, UR M21, UR M23, UR M32, UR M50) and UR M44 Rev.9, UR M51 Rev.4, UR M71 Rev.0, UR M72 Corr.1.

03. Section 4 - Turbomachinery / Gas Turbines and Exhaust Gas Turbochargers

Revision Date: May 2016

Entry into Force Date: July 2016

Section 4, has been generally revised according to UR M23 (Deleted) and UR M73 Rev.0.

04. Section 5 - Main Shafting

Revision Date: November 2015

Entry into Force Date: July 2016

According to Rec.143, a note is added under item C.6.2.3 as follows:

Note: In a closed fresh water system lubricated stern tube, the sample is to be drawn from the same agreed position in the system which should be positively identified. The sample should be representative of the water circulating within the stern tube (also refer to IACS Rec. No.143 Recommended procedure for the determination of contents of metals and other contaminants in a closed fresh water system lubricated stern tube).

Revision Date: January 2016

Entry into Force Date: July 2016

Item C.6.6.3 is revised as follows:

6.6.3 If the requirements according to 6.6~~5~~.1 and 6.6~~5~~.2 are fulfilled, the Class Notation **CM-PS** (Condition Monitoring – Planned Maintenance System) may be assigned.

05. Section 6 - Torsional Vibrations

Revision Date: April 2016

Entry into Force Date: July 2016

Item C.3.2 is revised as follows:

3.2 Where the values mentioned under C.3.1 are not available, the alternating torque in any reduction gear ~~step~~ stage for the case of continuous operation shall satisfy the following conditions:

Within the service speed range $0.9 \leq \lambda \leq 1.05$:

$$M_{alternating} \leq 0.3 \cdot M_{nominal} \quad [Nm] \qquad (15)$$

Within the service speed range lower than indicated (λ<0.9), the permissible value of alternating torque will be specially considered by **TL** in each case, but, in any case:

$$M_{alternating} \leq 1.3 \cdot M_{nominal} - M \quad [Nm] \qquad (16)$$

$M_{nominal}$ = Average torque in the stage under consideration at nominal speed, N.m

M = Average torque at the speed under consideration, N.m

06. Section 7 – Gears, Couplings

Revision Date: April 2016

Entry into Force Date: July 2016

Item C.7.2.7 has been revised as follows:

-In all other cases

Y_{DT} = ~~0.1~~ 1

07. Section 8 – Propellers

Revision Date: April 2016

Entry into Force Date: July 2016

Note added to item C.2.5

Note: A safety factor of ≥ 8,0 with respect to the ultimate tensile strength of the propeller material R_m can be used.

08. Section 12 - Steam Boilers

Revision Date: March 2016

Entry into Force Date: July 2016

Following note is added to Item H. Flue Gas Economizers as per UR P6 Rev.1:

(1) For shell type exhaust gas heated economizers that are intended to be operated in a flooded condition and that may be isolated from the steam plant system, UR P6 is to be applied.

09. Section 14 - Pressure Vessels

Revision Date: May 2016

Entry into Force Date: July 2016

Item A.1.4 has been revised as per UR M58 (Deleted) as follows:

1.4 In the case of the hydrophore tanks and the ~~charge~~ air coolers with a maximum allowable working pressure of up to 7 bar gauge and a maximum working temperature of 100°C an examination of the drawings can be dispensed with.

10. Section 18 - Fire Protection and Fire Extinguishing Equipment

Revision Date: May 2016

Entry into Force Date: July 2016

Table C.18.1 is revised as follows:

<table>
<tr><th rowspan="2">Spaces and areas to be protected</th><th colspan="2">Type of vessel</th></tr>
<tr><th>Cargo ships ≥ 500 GT</th><th>Passenger ships</th></tr>
<tr><td>Machinery spaces with internal combustion machinery used for the main propulsion and machinery spaces containing oil-fired plants (boilers, incinerators etc.) or oil fuel units (10)</td><td colspan="2">For all ships
CO_2, high-expansion foam or TL approved pressure water mist system (1) (2)</td></tr>
<tr><td>Machinery spaces of category A containing internal combustion engines not used for propelling the ships</td><td>≥ 375 kW</td><td>≥ 375 kW
CO_2, high-expansion foam or TL approved pressure water mist system (2)</td></tr>
</table>

11. Section 19 - Machinery for Ice Class Notation

Revision Date: June 2016

Entry into Force Date: July 2016

Section 19 has been generally revised according to Finnish-Swedish Ice Class 2010.

12. Section 20 - Tankers

Revision Date: June 2016

Entry into Force Date: July 2016

Item B.4.3.3 has been revised according to UI MPC4 Deleted as follows:

...

~~Provisions are to be made so that segregated ballast is to be discharged above the waterline in the deepest ballast condition. Discharge below the waterline is permitted if discharge procedures in accordance with MARPOL 73/78 Annex I Reg.30 are observed. For double bottom segregated ballast tanks the provision of a sampling line to the oil content meter or an arrangement similar to a part flow system is to be provided.~~ Ballast water is to be discharged in accordance with MARPOL 73/78 Annex I Reg.30.

PART B – CHAPTER 5 - ELECTRICAL INSTALLATION

01. Section 02 – Installation of Electrical Equipment

Revision Date: February 2016

Entry into Force Date: July 2016

Additions according IACS UR E11-Rev.03

G. Appliances for High Voltages (> 1 kV – ~~17,5~~ 15 kV AC)

1.2.2 If the lowest required protection against contact according to Table 8.3 is not ensured the equipment shall be installed in rooms whose access doors shall be locked in such a way that they can only be opened after isolating and earthing of the supply circuits and a suitable marking is to be placed which indicates danger of high-voltage.

1.4 The place of installation of switchgear without valid arc test shall be interlocked that access should be given only when the equipment is isolated. Other components, for which an arc test is required, shall be considered accordingly. An adequate, unobstructed working space is to be left in the vicinity of high voltage equipment for preventing potential severe injuries to personnel performing maintenance activities. In addition, the clearance between the switchboard and the ceiling/ deck-head above is to meet the requirements of the Internal Arc Classification according to IEC 62271-200

02. Section 5- Low Voltage Switchgear Assemblies

Revision Date: April 2016

Entry into Force Date: July 2016

Item C.1.6 has been revised as follows:

1.6 ~~Large~~ Hinged doors in switchboards must be fitted with arresting devices.

03. Section 08 – High Voltage Installations

Revision Date: February 2016

Entry into Force Date: July 2016

Additions according IACS UR E11-Rev.03

A. Scope

These rules also apply to a.c. three-phase ~~network systems~~ system with nominal voltages of > 1 kV ~~and highest voltage not greater than 17.5 kV and rated frequencies of 50 Hz or 60 Hz~~ up to 15 kV

Note: Where necessary for special application, higher voltages may be accepted by **TL**

B.

~~The values indicated in Table 8.1 are recommended as standard rated voltages and frequencies.~~

~~**Table 8.1 Rated voltages and rated frequencies**~~

~~**Rated voltage**~~ ~~**[kV]**~~	~~**Highest voltage for equipment [kV]**~~	~~**Rated frequency [Hz]**~~
~~3.0~~ ~~3.3~~	~~3.6~~	~~50~~ ~~60~~
~~6.0~~ ~~6.6~~	~~7.2~~	~~50~~ ~~60~~
~~10.0~~ ~~11.0~~	~~12.0~~	~~50~~ ~~60~~
~~15.0~~ ~~16.5~~	~~17.5~~	~~50~~ ~~60~~

Table 8.2~~1~~ Minimum clearances for voltage installations

~~**Highest voltage for E**~~**quipment** Nominal Voltage **[kV]**	**Minimum clearance [mm]**
3.6	55
7.2	90
12.0	120
17.5	160

3.2 Creepage distances

Creepage distances between live ~~components~~,parts and between live parts ~~and earthed components~~,metal parts ~~are to be~~ shall be designed in accordance with ~~the rated voltage of the system, allowance being made for the type are to be in accordance with~~ IEC 60092-503 for the nominal voltage of the system, the nature of the insulating material and ~~for~~ the transient ~~overvoltages due to~~ developed by switch~~ing operations and faults.~~ and fault conditions.

~~**3.2.1** In the busbar area, creepage distances shall not be less than 25 mm/kV for non-standardized components. The highest voltage for equipment according to IEC publication 60071-1 shall be used as a basis for the dimensioning.~~

~~**3.2.3** The creepage distances at busbar penetrations shall be in compliance with IEC publication 60137.~~

~~**3.2.4** The minimum creepage distance behind current limiting circuit breakers and fuses shall not be less than 16 mm/kV.~~

C.

2.1.2 In case of earth fault, the current is not to be greater than full load current of the largest generator on the switchboard or relevant switchboard section and not less than three times the minimum current required to operate any device against earth fault.

2.6 In the systems with neutral earthed, connection of the neutral to the hull is to be provided for each section.

4.1 Faults on the generator side of circuit-breakers

Protective devices are to be provided against phase-to-phase faults in the cables connecting the generators to the main switchboard and against interwinding faults within the generators. The protective devices are to trip the generator circuit breaker and to automatically de-excite the generator.

4.2 Earth-fault monitoring

Any earth fault in the system is to be indicated by means of a visual and audible alarm. In low impedance or direct earthed systems provision is to be made to automatic disconnect the faulty circuits. In high impedance earthed systems, where outgoing feeders will not be isolated in case of an earth fault, the insulation of the equipment is to be designed for the phase to phase voltage.

***Note**: Earthing factor is defined as the ratio between the phase to earth voltage of the health phase and the phase to phase voltage. This factor may vary between (1/~~sqrt 3~~√3) and 1.*

4.3.7 Power transformers are to be provided with overload and short circuit protection. When transformers are connected in parallel, tripping of the protective devices at the primary side has to automatically trip the switch connected at the secondary side

4.4 Voltage transformers for control and measuring purposes

~~Voltage transformers shall be protected on the secondary side against short-circuit and overload~~.

Voltage transformers are to be provided with overload and short circuit protection on the secondary side.

4.5 ~~HVHRC~~Fuses

~~The use of HVHRC fuses for overload protection is not permitted. They shall be used for short-circuit protection only~~ Fuses are not to be used for overload protection.

D.

2.1 Construction

Switchgear accessible for authorized persons only shall at least comply with accessibility type “A” of IEC publication 62271-200; Annex AA; AA 2.2.

In ~~public~~ accessible spaces by non-authorized persons, switchgear of accessibility type “B” shall be used. Besides this measures against unauthorized operation shall be provided.

Installation and location of the switchgear and controlgear shall correspond with its internal arc classification and classified sides (front, left and right).

2.1.1 Switchgear is to be of metal - enclosed type in accordance with I.E.C Publication 62271-200 or of the insulation - enclosed type in accordance with the I.E.C Publication 62271-201.

~~High voltage switchboards shall have metal clad enclosures which are fully partitioned and closed on all sides.~~

2.1.6 Where drawout switchgear units are used, the following conditions shall be met:

- Functional testing and maintenance shall be capable of being performed in safety, even when the busbar is live.

- ~~Drawout switchgear units shall be fitted with mechanical interlocking devices effective in the operating and disconnected position. A key interlock is permitted for maintenance purposes.~~Withdrawable circuit breakers and switches are to be provided with mechanical locking facilities in both service and disconnected positions. For maintenance purposes, key locking of withdrawable circuit breakers and switches and fixed disconnectors is to be possible.

  ~~Drawout switchgear units are to be lockable in the operating position.~~

- ~~The fixed contacts for drawout switchgear units are to be so arranged that, in the withdrawn position, the live contact components are automatically covered, or that complete withdrawal is possible only after a cover has been fitted.~~Withdrawable circuit breakers are to be located in the service position so that there is no relative motion between fixed and moving portions.

- The fixed contacts of withdrawable circuit breakers and switches are to be so arranged that in the withdrawable position the live contacts are automatically covered.

- Shutters are to be clearly marked for incoming and outgoing circuits. This may be achieved with the use of colours or lables.

2.1.7 Doors which give access to high voltage are to be interlocked in such a way that they can be opened only after closing the earthing switch.

At the entrance of the spaces where high-voltage electrical equipment is installed, a suitable marking is to be placed which indicates danger of high-voltage. As regard the high-voltage electrical equipment installed out-side a.m. spaces, the similar marking is to be provided. An adequate, unobstructed working space is to be left in the vicinity of high voltage equipment for preventing potential severe injuries to personnel performing maintenance activities. In addition, the clearance between the switchboard and the ceiling/deckhead above is to meet the requirements of the Internal Arc Classification according to IEC 62271-200 (see 2.1).

2.1.8 ~~It shall be possible to split main high voltage switchboards into two sections by means of at least one circuit breaker. This breaker shall be fitted with selective protection. It shall be possible to supply each section from at least one generator.~~ For maintenance purposes an adequate number of earthing and short-circuiting devices is to be provided to enable circuits to be worked upon with safety.

2.2.1 Where electrical energy and/or mechanical energy is required for the operation of switches, a means of storing such energy which is designed for at least two ON/OFF switching cycles of all the connected components shall be provided.

In general tripping due to overload, short circuit or undervoltage shall be independent of any stored electrical energy.

If shunt trip coils are used, the continuity of the tripping circuit has to be monitored. ~~When the wire breakage alarm is activated the switching on shall be interlocked. The power supply has to be monitored.~~This does not preclude shunt tripping provided that alarms are activated upon lack of continuity in the release circuits and power supply failures.

2.3.2 High-voltage test

~~A voltage test at power-frequency shall be performed on every switchgear unit.~~

~~The value of the alternating withstand voltage shall be selected in accordance with Table 8.4. The duration of the test is 1 minute in each case.~~

~~Table 8.4 Test voltages for switchgear~~

~~Rated voltage [kV]~~	~~Test voltage (r.m.s. value) AC withstand voltage [kV]~~	~~Impulse test voltage [kV]~~
~~1 – 3.6~~	~~10~~	~~40~~
~~3.6 – 7.2~~	~~20~~	~~60~~
~~7.2 – 12~~	~~28~~	~~75~~
~~12 – 17.5~~	~~38~~	~~95~~

A power-frequency voltage test is to be carried out on any switchgear and controlgear assemblies. The test procedure and voltages are to be according to the IEC Publication 62271-200 section 7/ routine test.

~~The following tests shall be carried out in every case:~~

~~– Conductor to earth,~~

~~– Between conductors.~~

~~For this purpose, each conductor of the main circuit is connected in turn to the high-voltage connection of the test unit. All the other conductors of the main and auxiliary circuits are to be earthed.~~

~~**The dielectrical tests are to be performed with all switching devices in the closed position, and with all withdrawable parts in the operating position.**~~

~~Voltage transformers or fuses may be replaced by dummies which simulate the electric field distribution of the high-voltage arrangement.~~

~~Overvoltage protection devices may be isolated or removed.~~

~~**2.3.3 Impulse voltage test**~~

~~An impulse voltage test in accordance with Table 8.4 may be recognized as equivalent to the high-voltagetest. The duration of the test comprises 15 successive pulses.~~

4.3 Tests

~~The tests specified in Section 20, A apply to high voltage machines, as and where appropriate.~~

In addition to the tests normally required for rotating machinery, a high frequency high voltage test in accordance with IEC Publication 60034-15 is to be carried out on the individual coils in order to demonstrate a satisfactory withstand level of the inter-turn insulation to steep fronted switching surges.

5.1.1 Power transformers and Liquid cooled transformers shall conform to IEC publication 60076.

5.1.6 Oil immersed transformers are to be provided with the following alarms and protections:

- liquid level (Low) - alarm

- liquid temperature (High) - alarm

- liquid level (Low) - trip or load reduction

- liquid temperature (High) - trip or load reduction

- gas pressure relay (High) – trip

6.1.1 High-voltage cables shall conform to IEC publication 60092-354 or 60092-353 or other equivalent standard.

6.1.2 High-voltage cables shall be readily identifiable by suitable mark~~ed~~ing.

E.

2.2 Separation of cables

2.2.1 High-voltage cables operating at different voltages are to be segregated from each other; in particular, they are not to be run in the same cable bunch, nor in the same ducts or pipes, or, in the same box. Where high voltage cables of different voltageratings are installed on the same cable tray, the air clearance between cables is not to be less than the minimum air clearance for the higher voltage side shown in Table 8.~~2~~1.

3. Tests

3.1 Tests following installation

When the installation work has been completed, high-voltage cables and its accesories are to undergo voltage withstand tests in the presence of a **TL** Surveyor; ~~the sealing ends and cable joints shall also be~~

~~tested. .~~ The test is ~~to conform to IEC publication 60502-1~~to be carried out after an insulation resistance test.

3.2 Voltage withstand tests can be made using an a.c. or a d.c. voltage. ~~The following tests can be applied alternatively:~~

3.2.1 For cables with rated voltage (U0/U) above 1.8/3 kV (Um=3.6 kV) an a.c. voltage withstand test may be carried out upon advice from high voltage cable manufacturer. One of the following test methods to be used:

~~**3.2.1** High-voltage test at 70 % of the DC voltage test value shown in Table 8.5 for a period of 15 minutes between conductor and shield, or~~

3.2.2~~1~~.1 Test using the rated (phase-to-phase) voltage/frequency between conductor and the metallic screen/ shield for a period of 5 minutes.

3.2.~~3~~ 1.2 Test using the operating voltage of the system for a period of 24 hours.

3.2.2 D.C. voltage tests are divided according their rated voltage (U_0/U) above and up to the value of 1,8/3 kV (U_m = 3,6 kV) as below:

3.2.2.1 For cable with rated voltage above 1,8/3 kV (U_m = 3,6 kV), d.c. test voltage equal to 4 U_0 may be applied for 15 minutes.

3.2.2.2 For cable with rated voltage up to 1,8/3 kV (U_m = 3,6 kV), d.c. voltage equal to 4 U_0 shall be applied for 15 minutes.

3.4 After completion of the test the conductors are to be connected to earth for a sufficient period in order to remove any trapped electric charge.

An insulation resistance test is then repeated.

04. Section 12 - Cable Network

Revision Date: April 2016

Entry into Force Date: July 2016

Table 12.9 has been revised as follows:

Nominal cross-section		Current-carrying capacity based on a maximum conductor operating temperature					
		90 °C			95 °C		
mm²	AWG/MCM	S1-Cont. Operation A (max.)	S2-30 min. A. (max)	S2-60 min. A. (max)	S1-Cont. Operation A (max.)	S2-30 min. A. (max)	S2-60 min. A. (max)
Single-core cables							
1.0	17	18	19	19	20	21	21
1.5	15	23	24	24	24	25	25
2.5	13	~~40~~ 30	~~43~~ 32	~~43~~ 32	32	34	34
4		~~51~~ 40	~~54~~ 43	~~54~~ 43	42	45	45
6	11	52	55	55	55	58	58
…	…	…	…	…	…	…	…

05. Section 15 – Hull Outfitting

Revision Date: April 2016

Entry into Force Date: July 2016

Additions according IACS UI SC274

A.

5. Cable Installation

5.1 In tankers, electrical equipment, cables and wiring shall not be installed in hazardous locations unless it conforms with standards not inferior to those acceptable to the Organization.

However, for locations not covered by such standards, electrical equipment, cables and wiring which do not conform to the standards may be installed in hazardous locations based on a risk assessment to the satisfaction of the Administration, to ensure that an equivalent level of safety is assured.

5.2 In hazardous areas, cables shall be laid only for equipment whose use is permitted in these areas; cables related to other requirements of this Section may also pass through these areas. Cables shall be reliably protected against damage.

5.3 All cables liable to be exposed to the cargo, oil vapours or gases shall be armoured or shielded, and shall have an overall watertight and oil-resistant outer sheath.

5.4 Each intrinsically safe system shall have its own separate cable. It is not permissible for intrinsically safe- and non-intrinsically safe circuits to lay these together in a cable bundle or pipe or to mount them under common clamps (see Section 12, C. 5.7). Intrinsically safe cables shall be marked.

06. Section 20 - Electrical Equipment

Revision Date: June 2016

Entry into Force Date: July 2016

Items F.7.3 and B. have been revised as follows:

7.3 Major modifications to the electrical installations of ships in service or new ships under construction;

- Individual tests on type-approved cables and wires shall be performed at the manufacturer's works in the presence of a **TL** Surveyor

- Individual tests on non-type-tested cables and wires shall be performed according to **TL** rules at the manufacturer’s works in the presence of a **TL** Surveyor. The scope of the tests shall be agreed according to the related standards in advance.

At least the following tests shall be carried out:
Item B has been generally revised as follows:

B. Power Transformers ~~and Reactance Coils~~

1. General

The design of transformers shall in general comply with the requirements of IEC 60092-303 and relevant parts of IEC 60076 – "Power Transformers".

For high-voltage transformers ~~machines~~, see also Section 8.

1.1 Coolant

Preferably dry type transformers shall be used on board of ships.
For separately cooled transformers the cooling air shall be monitored and alarm on failure. Where forced cooling is used, it shall be possible to operate at reduced power on failure.

1.2 Windings

All transformers shall have separate windings for primary and secondary coils, except for starting- and ignition transformers, which may be of the autotransformer type. Medium voltage distribution transformers and propulsion transformers are to be provided with temperature monitoring. Medium voltage propulsion transformers shall have earthed screen windings.

2. Rating

2.1 Voltage variation during loading

Under resistive load, the voltage variation between no-load and full-load shall not exceed ~~5~~ 2,5 %.
This requirement does not apply to short-circuit-proof transformers.

2.2 Temperature rise

The temperature rise of windings shall not exceed the values listed in Table 20.6.
Parts of casings with surface temperatures over 80°C shall be protected against unintentionally contact.

2.3 Short-circuit resistance

~~Transformers, in co-operation with their protection devices, shall be able to withstand without damage the effects of external short circuits.~~
Transformers shall be constructed to withstand a primary or secondary terminal short circuit with a duration of minimum 1 s, with rated primary voltage and frequency, without damage to internal parts or enclosure.

2.4 Parallel operation

Transformers for parallel operation shall have compatible coupling groups and voltage regulation. The actual current of each transformer will not differ from its proportionate share of the total load by more than 10% of its full load current.

3. Rating Plate

Transformers shall be provided with a durable corrosion-resistant rating plate, giving the following information:

- make, type, serial no.
- performance standard
- rated values for: output apparent power, voltage(s),frequency, current(s)
- duty type, if other than S1
- thermal classification of insulation
- IP code of enclosure and termination box
- vector group of windings
- maximum permissible cooling medium temperature
- short circuit impedance value
- liquid type (if applicable)
- total mass.

4. Tests

Transformers shall be tested in the manufacturer's works. Transformers rated with 100 k~~VA~~W and above shall be tested in the presence of a Surveyor. A works test report covering the tests carried out shall be prepared. The works test reports shall be presented on request. Tests noted as type tests (TT) shall be carried out on a prototype or the first of a batch of identical transformers. Tests noted as routine tests (RT) shall be carried out on each transformer.

Required inspection and tests for transformers are given in Table 20.7.

Scope of the tests:

4.1 Heat test

The test shall be performed to determine the temperature rise, which shall not exceed the maximum permissible values shown in Table 20.6.

Temperature test at full load may be difficult to realise on large transformers, due to insufficient test power being available. One of these simulated tests, or equivalent may be accepted:

- back to back method, according to IEC 60076-11 23.2.2
- simulated load method, according to IEC 60076-11 23.2.1.

Temperature-rise tests on transformers of identical construction and carried out not more than 3 years previously may be recognized. The referenced temperature rise shall be 10 % below the values shown in Table 20.6.

Table 20.6 Permissible temperature rise of transformer- and reactance coil windings with an ambient temperature of 45 °C

Insulation class	A	E	B	F	H
Temperature rise (K)	55	70	75	95	120

The following tests shall be performed at approximately operating temperature.

4.2 Induced overvoltage test

The windings shall be tested at twice the rated voltage and at increased frequency to verify that the insulation between turns is sufficient and satisfactory. The applied frequency shall be tested up to twice of nominal frequency (including twice of nominal frequency) for 60 seconds. The duration of the test shall be

$$120\ \text{s} \cdot \frac{\text{rated frequency}}{\text{test frequency}}$$

but not less than 15 s.

4.3 Short-circuit test

On request, the short-circuit proof property in accordance with 2.3 shall be verified.

4.4 Winding test (High Voltage Test)

The test voltage shown in Table 20.8 shall be applied after temperature rise test (if done) between the winding parts to be tested and all other windings, which are to be connected to the core and the frame during the test.
The test voltage shall be applied for one minute.

After rewinding or other extensive repair the transformer shall be subjected to a high voltage test with a test voltage of at least 75% of that specified in Table 20.8.

Tablo 20.7 Scope of testing and inspection of transformers

No.	Explanations	Routine Tests	Type Tests	IEC reference
1	Inspection of enclosure, terminations, instrumentation or protection	x		
2	Measuring of insulation resistance	x		
3	Measuring of voltage ratio at no load and check of phase displacement	x		IEC 60076-11.16
4	Measuring of winding resistance	x		IEC 60076-11.15
5	Short circuit impedance and load losses	x		IEC 60076-11.17
6	Measuring of no-load loss and current	x		IEC 60076-11.18
7	Separate-source AC withstand voltage test	x		IEC 60076-11.19
8	Inducted AC withstand voltage test	x		IEC 60076-11.20
9	Temperature rise test		x	IEC 60076-11.23
10	Partial discharge measurement on transformer windings with Um ≥ 3.6 kV. Maximum level of partial discharge shall be 10 pC. (Not applicable to liquid immersed transformers.)	x		IEC 60076-11.22

Table 20.8 Test voltage for transformers ~~and reactance coil windings~~

Maximum operating voltage [V]	Alternating withstand voltage [V]
≤1000	3000
3600	10000
7200	20000
12000	28000
17500	38000

4.5 Determination of insulation resistance

The measurement of insulation resistance shall be carried out at the end of the test sequence. Test voltage and minimum insulation resistance is given in Table 20.5. The test shall be carried out between: ~~with a DC voltage of at least 500 V.~~

~~The insulation resistance shall be at least:~~
~~- 5 MΩbetween primary and secondary winding,~~
~~- 2 MΩ for the remaining insulation.~~

- all current carrying parts, connected together, and earth
- all current carrying parts of different polarity or phase, where both ends of each polarity or phase are individually accessible.

The insulation resistance shall at least conform to the values indicated in Table 20.5.

4.6 Onboard testing

All transformers shall be subject to function tests with intended loading, after installation onboard.

PART C – CHAPTER 10 - LIQUEFIED GAS TANKERS

01. Section 3 - Ship Arrangements

Revision Date: May 2016

Entry into Force Date: July 2016

Item 3.2.6 Note is revised as follows:

Note: Compliance with other relevant paragraphs of the Code and in particular with paragraphs 3.2.4, 3.8, 8.2.10 and 12.1.6 where applicable would also ensure compliance with this paragraph.

Air outlets are subject to the same requirements as air inlets and air intakes. This interpretation also applies to paragraphs 3.2.2, 3.8.4 and 8.2.10.

Doors facing the cargo area or located in prohibited zones in the sides are to be restricted to stores for cargo-related and safety equipment, cargo control stations as well as decontamination showers and eye wash.

The item 3.2.6 above is to be interpreted as follows:

1. The closing devices need not be operable from within the single spaces and may be located in centralized positions. Engine room casings, cargo machinery spaces, electric motor rooms and steering gear compartments are generally considered as spaces not covered by paragraph 3.2.6 and therefore the requirement for closing devices need not be applied to these spaces.

2. The closing devices are to give a reasonable degree of gas tightness. Ordinary steel fire-flaps without gaskets/seals are not to be considered satisfactory.

~~- *The requirement for fitting air intakes and openings with closing devices operable from inside the space in ships intended to carry toxic products should apply to spaces which are used for the ships 'radio and main navigating equipment, cabins, mess rooms, toilets, hospitals, galleys, etc., but should not apply to spaces not normally manned such as deck stores, forecastle stores, engine room casings, steering gear compartments, workshops. The requirement does also not apply to cargo control rooms located within the cargo area.*~~

~~- *When internal closing is required, this shall include both ventilation intakes and outlets.*~~

~~- *The closing devices shall give a reasonable degree of gas tightness. Ordinary steel fire-flaps without gaskets/seals shall normally not be considered satisfactory.*~~

Note is added to end of item 3.7.5 as follows:

...

Note: The requirements of "Pump vents should not be open to machinery spaces" and "Pump vents shall not be open to machinery spaces" apply only to pumps in the machinery spaces serving dry duct keels through which ballast piping passes..

Revision Date: April 2016

Entry into Force Date: July 2016

The note under item 3.5.3 has been revised accordance with UI GC16 as follows:

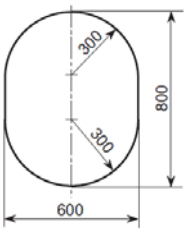
3.5.3

...

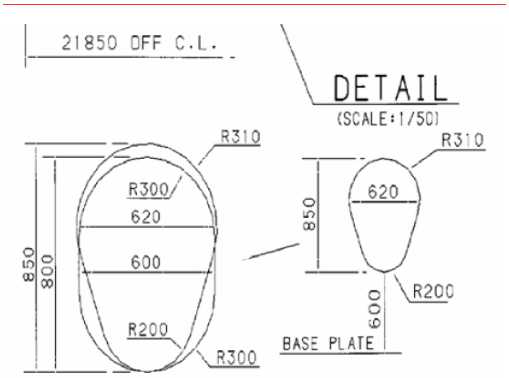
Note: *For the purpose of subparagraph 3.5.3.1.2 and 3.5.3.1.3 the following applies:*

1. The minimum clear opening of 600 mm x 600 mm may have corner radii up to 100 mm maximum. In such a case where as a consequence of structural analysis of a given design the stress is to be reduced around the opening, it is considered appropriate to take measures to reduce the stress such as making the opening larger with increased radii, e.g. 600 x 800 with 300 mm radii, in which a clear opening of 600 mm x 600 mm with corner radii up to 100 mm maximum fits.

2. The minimum clear opening of not less than 600 mm x 800 mm may also include an opening with corner radii of 300 mm. An opening of 600 mm in height x 800 mm in width may be accepted as access openings in vertical structures where it is not desirable to make large opening in the structural strength aspects, i.e. girders and floors in double bottom tanks.



3. Subject to verification of easy evacuation of injured person on a stretcher the vertical opening 850 mm x 620 mm with wider upper half than 600 mm, while the lower half may be less than 600 mm with the overall height not less than 850 mm is considered an acceptable alternative to the traditional opening of 600 mm x 800 mm with corner radii of 300 mm.



4. If a vertical opening is at a height of more than 600 mm steps and handgrips are to be provided. In such arrangements it is to be demonstrated that an injured person can be easily evacuated.

02. Section 4 – Cargo Containment

Revision Date: May 2016

Entry into Force Date: July 2016

Note of item 4.6.3.4 is revised as fallow:

Note: For effectiveness assessment of containment systems with glued secondary barriers:

- *At the time of construction, a tightness test should be carried out in accordance with approved system designers' procedures and acceptance criteria before and after initial cool down. Low differential pressures tests are not considered an acceptable test.*

- *If the designer's threshold values are exceeded, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing should be carried out.*

- *The values recorded should be used as reference for future assessment of secondary barrier tightness.*

For containment systems with welded metallic secondary barriers, a tightness test after initial cool down is not required.

The phrase of "(see also IACS UI GC13 Rev1)" is added to end of items 4.20.3.5 and 4.20.3.7.

03. Section 15 - Filling Limits For Cargo Tanks

Revision Date: May 2016

Entry into Force Date: July 2016

Item 15.5.3 is revised as fallow:

15.5.3 For ships constructed before 1 July 2016 and subject to IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (MSC.5(48)), ~~Regardless of the date of construction of the ship~~ type C cargo tanks can be loaded in accordance with the provisions of paragraph 15.5.2 or, alternatively, to the provisions of paragraph 15.5.1.

PART C – CHAPTER 35 - TENTATIVE RULES FOR SHIPS LESS THAN 500 GT

01. Chapter 35 - B Machinery

Revision Date: January 2016

Entry into Force Date: July 2016

Section 4, Items B.2.1.6, B.2.1.7.1, B.2.2 and B.2.3 have been revised as follows:

2.1.6 For bilge main diameter obtained from the formula given in item 2.2 ~~1.3.1~~ and speed of water not less than 1.2 m/s, minimum capacity Q of the required bilge pump may be determined from the following equation:

$$Q = 3.45 \cdot 10^{-3} \cdot {d_H}^2$$

...

2.1.7.1 The total capacity of the bilge pumps is not to be less than the following formula:

$$Q = 8.28 \cdot 10^{-3} \cdot {d_H}^2$$

...

2.2 Bilge main

The internal diameter of the main bilge line suction is to be determined by the following equation. The actual internal diameter of the bilge main may be rounded off to the nearest pipe size of recognised standard.

$$d_H = 25 + 1.68 \cdot \sqrt{L_C \cdot (B + H)}$$ *(Not being less than 35 mm)*

2.1.7.1 The total capacity of the bilge pumps is not to be less than the following formula:

$$Q = 8.28 \cdot 10^{-3} \cdot {d_H}^2$$

...

2.3 Suctions in holds and machinery spaces

The internal diameter, in mm, of bilge pipes situated between collecting boxes and suctions in holds and machinery spaces, is to be of the commercial size nearest to the diameter given by the following formula, in mm:

$$d_Z = 25 + 2.16 \cdot \sqrt{L_1 \cdot (B + H)}$$

Revision Date: June 2016

Entry into Force Date: July 2016

Section 4, Item A.2.3 has been revised as follows:

$$b = \frac{\text{~~10~~}(D \cdot s_o)}{\text{~~4~~}2{,}5 \cdot r}$$

PART D – CHAPTER 70 – MULTI MOORING SYSTEMS

01. Section 7 – Positionning and Installation

Revision Date: February 2016

Entry into Force Date: July 2016

C.

10. Design Criteria

If not indicated elsewhere in these Rules, the structural and mechanical components (mooring hardware, e.g., connecting links, shackles, etc.) which transmit the mooring loads are to be designed to the greater of the following two loads:

- 2.50 times the maximum design anchor leg (or mooring line) load in design storm condition.
- 3.00 times the maximum design anchor leg (or mooring line) load in operating condition.

PART E – CHAPTER 101 - NAVAL SHIP TECHNOLOGY, CLASSIFICATION AND SURVEYS

01. Section 1 – Classification and Surveys

Revision Date: March 2016

Entry into Force Date: July 2016

Client's responsibilities

C.

10. Client's responsibilities

10.1 It is the responsibility of the Owners/ operators, designers, builders and installers to familiarize themselves and to abide by the appropriate sections of the Rules.

02. Section 2 – Classification and Surveys

Revision Date: April 2016

Entry into Force Date: July 2016

LHD notation is added to item C.2.1.2 and Table 2.2.

2.1.2 Where the intended duties of the ship include support functions which may be described by Notations also used for commercial and/or state operated non-military craft, such Notations may be assigned instead of or in addition to the Notations referred to under 2.1, see **TL** - Classification and Surveys, Section 2, D.

Examples for such Notations are:

PATROL BOAT

SUPPLY VESSEL

RESEARCH VESSEL

AMPHIBIOUS WARFARE SHIP (LPD, LHD, LST, LCT, LCM, etc.)

MOSHIP Submarine Rescue Mother Ship

RATSHIP Rescue and Towing Ship

LCT Landing Craft Tank

LCM Landing Craft Mechanized

LST Landing Ship Tank

LPD Landing Platform Dock

LHD Landing Helicopter Dock

PRODUCT TANKER

TUG

ESCORT TUG (p,V)

Table 2.2 Summary of notations for naval ships

Chapter 101 **Classification and Surveys**	**Chapter 102** **Hull Structures and Ship Equipment**	**Chapter 104** **Propulsion Plants**	**Chapter 105/106** **Electrical Installations / Automation**	**Chapter 107** **Ship Operation, Installations and Auxiliary Systems**
Ship type: **CORVETTE** **FRIGATE** **DESTROYER** **CRUISER** **MINE WARFARE VESSEL** **AMPHIBIOUS WARFARE SHIP** **AIRCRAFT CARRIER** **PATROL BOAT** **SUPPLY VESSEL** **RESEARCH VESSEL** **AMPHIBIOUS WARFARE SHIP** (LPD, LHD, LST, LCT, LCM, etc.) **MOSHIP** Submarine Rescue Mother Ship **RATSHIP** Rescue and Towing Ship **LCT** Landing Craft Tank **LCM** Landing Craft Mechanized **LST** Landing Ship Tank **LPD** Landing Platform Dock **PRODUCT TANKER** **TUG (4)** **ESCORT TUG (p,V) (5)** **SUBMARINE** **LHD** Landing Helicopter Dock **…**	Ambient conditions: **AC1** **ACS** Material: **(HIGHER STRENGTH HULL STRUCTURAL STEEL)** **ALUMINIUM** **FRP** Residual strength after military effects: **RSM** Rational ship design: **RSD (F25)** **RSD (F30)** **RSD (ACM)** In-water survey: **IWS** Structural fire protection: **SFP** Navigation in ice: **B** Bridge design: **NAV-O** **NAV-OC** **…**	Condition monitoring: **CM1** **CM2** **CM3** **CM4** Redundant propulsion: **RP1** x % **RP2** x % **RP3** x % Dynamic positioning: **DK1** **DK2** **DK3** Fuel Cell Systems: **FC-xxx** **with FC** Navigation in ice: **B** Novel design: **EXP** Air Independent Power: **…**	Automation: **AUT-N** **AUT-Nnh** **AUT-C(NS)** Degaussing: **DEG** Quality of Electrical Power Supplies: **ELS** Integrated Computer Control: **ICC** **…**	Lifting appliances: **LA** **LA (CL)** **LA (CR)** **LA (PL)** Replenishment at sea: **RAS** Flight operation: **FO** NBC protection: **NBC** Diving systems: **DI** Environmental Passport: **EP (6)** Fire Fighting **(7)** : **FF0** **FF1** **FF2** **FF3** **FF1/2** **FF1/3** **…**

PART E – CHAPTER 102 - HULL STRUCTURES AND SHIP EQUIPMENT

01. Section 5 – Design Loads

Revision Date: March 2016

Entry into Force Date: July 2016

Item A.3 has been revised as follows:

c_{RW} = service range coefficient

c_{RW} = 1,0 for unlimited service range

= 0,90 for restricted service area **Y**

= 0,75 for restricted service area **K50~~/20~~**

= 0,66 for restricted service area **K20**

= 0,60 for restricted service area **K6**

02. Section 18 - Anchoring and Mooring Equipment

Revision Date: March 2016

Entry into Force Date: July 2016

Table 18.1 is revised as follows:

Equipment numeral EN	**2 stock-less bower anchors**	**Stud link chain cables**					**Chain cables**	**Recommended ropes**				
		Bower anchors						**Towline**		**Mooring ropes**		
	Mass per anchor	**Total length**	**Diameter (1)**					**Length**	**Breaking load**	**Number**	**Length**	**Breaking load**
			d_1	d_2	d_3	d_4						
	[kg]	[m]	[mm]	[mm]	[mm]	[mm]		[m]	[kN]	-	[m]	[kN]
...												
1480-1570	4590	550 ~~590~~	68	60	52	-		220	890	5	190	325
...												

03. Section 20 - Structural Fire Protection

Revision Date: March 2016

Entry into Force Date: July 2016

Items A.1.1 and C.1 have been revised as follows:

A.

1. Application

1.1 The requirements of this Section are divided into two parts. Basic requirements according to B. and some parts of C., which are determined case by case between the Naval Authority and the shipyard and agreed by TL, apply to all classified naval ships. In case the class notation SFP is granted, all additional requirements according to C. ~~are optional and~~ are to be complied with. ~~in case the Class Notation SFP shall be granted without~~

C.

1. General

The requirements of C. are additional to those of B. They are based on relevant experience and inter-national regulations, but their use is optional in accor-dance with the intentions of the Naval Authority and if fully met, the Class Notation SFP (structural fire protection) will be granted. The requirements of C. take precedence over B. For ships without SFP refer to A.1.1.~~without~~

PART E – CHAPTER 104 - PROPULSION PLANTS

01. Section 7 - Propeller

Revision Date: May 2016

Entry into Force Date: July 2016

Table 7.3 has been revised as follows:

<table>
<tr><td colspan="3" rowspan="2">Subsystem or component</td><td colspan="4">Minimum requirements for Class Notation</td></tr>
<tr><td>DK0</td><td>DK1</td><td>DK 2</td><td>DK 3</td></tr>
<tr><td rowspan="7">Power system</td><td colspan="2">Generators and prime mover</td><td colspan="2">---</td><td>redundant</td><td>redundant, separate compartments</td></tr>
<tr><td colspan="2">Main switchboard</td><td colspan="2">1</td><td>2</td><td>2 in separate compartments</td></tr>
<tr><td colspan="2">Bus-tie breaker</td><td colspan="2">---</td><td>2 NO[1]</td><td>2 NO</td></tr>
<tr><td colspan="2">Distribution system</td><td colspan="2">---</td><td>redundant</td><td>redundant, through separate compartments</td></tr>
<tr><td colspan="2">Power management</td><td colspan="2">---</td><td>redundant</td><td>redundant, separate compartments</td></tr>
<tr><td colspan="2">UPS for DP control system</td><td>---</td><td>1</td><td>2</td><td>2 + 1 in separate compartments</td></tr>
<tr><td>Thruster system</td><td colspan="2">Arrangement of thrusters</td><td colspan="2">---</td><td>redundant</td><td>redundant, separate compartments, provided WFC is not exceeded</td></tr>
<tr><td colspan="3">DP relevant auxiliary systems</td><td colspan="2">---</td><td>redundant[2]</td><td>redundant, separate compartments</td></tr>
<tr><td rowspan="2">DK-Control system</td><td colspan="2">no. of computer systems</td><td colspan="2">1</td><td>2</td><td>2+1 in separate compartments</td></tr>
<tr><td colspan="2">independent joystick with auto heading</td><td>---</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td rowspan="4">Sensors</td><td colspan="2">Position reference systems</td><td>1</td><td>2</td><td>3</td><td colspan="2">3 whereof 1 connected to back-up control system</td></tr>
<tr><td rowspan="3">Vessel's sensors</td><td>Wind</td><td colspan="2">1</td><td>2</td><td>2</td><td rowspan="3">one of each connected to back-up control</td></tr>
<tr><td>VRS</td><td colspan="2">1</td><td>2</td><td>2</td></tr>
<tr><td>Gyro</td><td colspan="2">1</td><td>3</td><td>3</td></tr>
<tr><td colspan="3">Essential non-DK systems[3]</td><td colspan="2">---</td><td>redundant</td><td>redundant, separate compartments</td></tr>
<tr><td colspan="3">Printer</td><td colspan="2">yes</td><td>yes</td><td>yes</td></tr>
</table>

[1] NC bus-tie breakers may be accepted depending on the findings of the FMEA and additional testing (NO = nominally open, NC = nominally closed)
[2] when active components are used
[3] see TL Rules Chapter 22 – Dynamic Positioning Systems, Section 2, B.6. for essential non-DP systems

PART E – CHAPTER 105 - ELECTRIC

01. Section 3 - Power Supply Installations

Revision Date: February 2016

Entry into Force Date: July 2016

Item C.2.1.4 is revised as follows:

2.1.4 For 18 hours

…

- all ship's navigational appliances stipulated by **SOLAS** V/19 ~~12~~;

02. Section 5 - Low-Voltage Switchgear Assemblies

Revision Date: April 2016

Entry into Force Date: July 2016

Item C.1.6 has been revised as follows:

1.6 ~~Large~~ Hinged doors in switchboards ~~(> 0.5 m2)~~ must be fitted with arresting devices.

03. Section 14 - Electrical Equipment

Revision Date: April 2016

Entry into Force Date: July 2016

Item B.1.9 has been revised to explain the meaning of main generators as follows:

Main generators supplying the motors of electric propulsion systems and propulsion motors/generators shall be fitted with sensors for monitoring the winding temperature.

Revision Date: June 2016

Entry into Force Date: July 2016

Items G.8.3 and C. have been revised as follows:

8.3 Major modifications to the electrical installations of ships in service or new ships under construction;

- Individual tests on type-approved cables and wires shall be performed at the manufacturer's works in the presence of a **TL** Surveyor.
- Individual tests on non-type-tested cables and wires shall be performed according to **TL** rules at the manufacturer's works in the presence of a TL Surveyor.

The scope of the tests shall be agreed according to the related standards in advance. At least the following tests shall be carried out:
Item C has been generally revised as follows:

C. Power Transformers ~~and Reactance Coils~~

1. General ~~Requirements~~

The design of transformers shall in general comply with the requirements of IEC 60092-303 and relevant parts of IEC 60076 – "Power Transformers".
For high-voltage transformers, see also Section 8.

1.1 Coolant

Preferably dry type transformers shall be used on board of ships.
For separately cooled transformers the cooling air shall be monitored and alarm on failure. Where forced cooling is used, it shall be possible to operate at reduced power on failure.

1.2 Windings

All transformers shall have separate windings for primary and secondary coils, except for starting- and ignition transformers, which may be of the autotransformer type. Medium voltage distribution transformers and propulsion transformers are to be provided with temperature monitoring. Medium voltage propulsion transformers shall have earthed screen windings.

2. Rating

2.1 Voltage variation during loading

Under resistive load, the voltage variation between no-load and full-load shall not exceed ~~5~~ 2,5 %.
This requirement does not apply to short-circuit-proof transformers.

2.2 Temperature rise

The temperature rise of windings shall not exceed the values listed in Table 14.6.
Parts of casings with surface temperatures over 80°C shall be protected against unintentionally contact.

2.3 Short-circuit resistance

~~Transformers, in conjunction with their protection devices, must be able to withstand without damage the effects of external short-circuits.~~
Transformers shall be constructed to withstand a primary or secondary terminal short circuit with a duration of minimum 1 s, with rated primary voltage and frequency, without damage to internal parts or enclosure.

2.4 Parallel operation

Transformers for parallel operation shall have compatible coupling groups and voltage regulation. The actual current of each transformer will not differ from its proportionate share of the total load by more than 10% of its full load current.

3. Rating Plate

Transformers shall be provided with a durable corrosion-resistant rating plate, ~~If special designations are required, this must be stipulated by the Naval Authority~~ giving the following information:

- make, type, serial no.
- performance standard
- rated values for: output apparent power, voltage(s),frequency, current(s)
- duty type, if other than S1
- thermal classification of insulation
- IP code of enclosure and termination box
- vector group of windings
- maximum permissible cooling medium temperature
- short circuit impedance value
- liquid type (if applicable)
- total mass.

4. Tests

~~**4.1** Transformers rated at more than 50 kVA shall be tested at the manufacturer's works in the presence of a TL Surveyor and have to undergo the following tests.~~

Transformers shall be tested in the manufacturer's works. Transformers rated with 100 kW and above shall be tested in the presence of a Surveyor. A works test report covering the tests carried out shall be prepared. The works test reports shall be presented on request. Tests noted as type tests (TT) shall be carried out on a prototype or the first of a batch of identical transformers. Tests noted as routine tests (RT) shall be carried out on each transformer.

Required inspection and tests for transformers are given in Table 14.7.

Scope of the tests:

4.1 Heat test

The test shall be performed to determine the temperature rise, which shall not exceed the maximum permissible values shown in Table 14.6.

Temperature test at full load may be difficult to realise on large transformers, due to insufficient test power being available. One of these simulated tests, or equivalent may be accepted:

- back to back method, according to IEC 60076-11 23.2.2
- simulated load method, according to IEC 60076-11 23.2.1.

Temperature-rise tests on transformers of identical construction and carried out not more than 3 years previously may be recognized. The referenced temperature rise shall be 10 % below the values shown in Table 14.6.

Table 14.6 Permissible temperature rise of transformer- and reactance coil windings with an ambient temperature of 45 °C

Insulation class	A	E	B	F	H
Temperature rise (K)	55	70	75	95	120

The following tests shall be performed at approximately operating temperature.

4.2 Induced overvoltage test

The windings shall be tested at twice the rated voltage and at increased frequency to verify that the insulation between turns is sufficient and satisfactory. The applied frequency shall be tested up to twice of nominal frequency (including twice of nominal frequency) for 60 seconds. The duration of the test shall be

$$120\ \text{s} \cdot \frac{\text{rated frequency}}{\text{test frequency}}$$

but not less than 15 s.

4.3 Short-circuit test

~~The short-circuit proof property in accordance with 2.3 shall be verified.~~

On request, the short-circuit proof property in accordance with C.2.3 shall be verified.

Tablo 14.7 Scope of testing and inspection of transformers

No.	Explanations	Routine Tests	Type Tests	IEC reference
1	Inspection of enclosure, terminations, instrumentation or protection	x		
2	Measuring of insulation resistance	x		
3	Measuring of voltage ratio at no load and check of phase displacement	x		IEC 60076-11.16
4	Measuring of winding resistance	x		IEC 60076-11.15
5	Short circuit impedance and load losses	x		IEC 60076-11.17
6	Measuring of no-load loss and current	x		IEC 60076-11.18
7	Separate-source AC withstand voltage test	x		IEC 60076-11.19
8	Inducted AC withstand voltage test	x		IEC 60076-11.20
9	Temperature rise test		x	IEC 60076-11.23
10	Partial discharge measurement on transformer windings with Um ≥ 3.6 kV. Maximum level of partial discharge shall be 10 pC. (Not applicable to liquid immersed transformers.)	x		IEC 60076-11.22

4.4 Winding test (High Voltage Test)

The test voltage shown in Table 14.8 shall be applied after temperature rise test (if done) between the winding parts to be tested and all other windings, which are to be connected to the core and the frame during the test.
The test voltage shall be applied for one minute.

After rewinding or other extensive repair the transformer shall be subjected to a high voltage test with a test voltage of at least 75% of that specified in Table 14.8.

Table 14.8 Test voltage for transformers ~~and reactance coil windings~~

Maximum operating voltage [V]	Alternating withstand voltage [V]
≤1000	3000
3600	10000
7200	20000
12000	28000
17500	38000

4.5 Determination of insulation resistance

~~The measurement of insulation resistance at lowvoltage transformers shall be carried out at the end of the test sequence with a DC voltage of at least 500 V. The insulation resistance shall be at least:~~
~~- 5 MΩ between primary and secondary winding~~
~~- 2 MΩ for the remaining insulation~~

The measurement of insulation resistance shall be carried out at the end of the test sequence. Test voltage and minimum insulation resistance is given in Table 14.5. The test shall be carried out between:

- all current carrying parts, connected together, and earth
- all current carrying parts of different polarity or phase, where both ends of each polarity or phase are individually accessible.

The insulation resistance shall at least conform to the values indicated in Table 14.5.

4.6 Onboard testing

All transformers shall be subject to function tests with intended loading, after installation onboard.

ADDITIONAL RULE – TURK LOYDU SURVEY AND CERTIFICATION RULES ON ENERGY EFFICIENCY OF SHIPS (MARPOL 73/78 ANNEX VI, CHAPTER 4)

01. General

Revision Date: May 2016

Entry into Force Date: July 2016

References of 2014 Guidelines on the method of calculation of the attained energy efficiency design index (EEDI) for new ships, 2014 Guidelines on survey and certification of the energy efficiency design index (EEDI), Industry guidelines on calculation and verification of the energy efficiency design index (EEDI) (submitted by BIMCO, CESA, IACS, ICS, INTERCARGO, INTERTANKO, ITTC, OCIMF and WSC) and 2013 Interim guidelines for determining minimum propulsion power to maintain the manoeuvrability of ships in adverse conditions are revised according to resolution of MEPC 68 and item 5 is revised as follow:

...

For ensuring the quality of tank tests, ITTC quality system should be taken into account. TL is to familiarize with the towing tank test organization test facilities, measuring equipment, standard model-ship extrapolation and correlation method (applied method and tests description) and quality system for consideration of complying with the requirements of 15.6 of MEPC 68/INF.30 prior to the test attendance when TL has no recent experience with the tank test facilities.

When in addition the towing tank test organization quality system is not ISO 9001 certified; the following additional information relative to the towing tank test organization is to be submitted to TL:

- Descriptions of the tank test facility; this should include the name of the facility, the particulars of tanks and towing equipment, and the records of calibration of each monitoring equipment.

- Quality manual containing at least the information listed in the ITTC Sample quality manual (2002 issue) Records of measuring equipment calibration.

- ~~Standard model-ship extrapolation and correlation method (applied method and tests description).~~

TL will audit the quality management system of the towing tank if previous experience is insufficiently demonstrated.

Model tank test should be witnessed by the TL or further to the agreement of the submitter of the EEDI Technical File and the Shipowner, TL may accept towing tank tests reports witnessed by another Society if the towing tank tested ship is of the same type as the ship of which the EEDI is verified. Acceptance of towing tank tests witnessed by another Society:

- Copies of the following documents are to be provided to TL, with due consideration given to the protection of the Intellectual Property Rights (IPR) as indicated under paragraph 14 of MEPC 68/INF.30:

- Calculation of the reference speed of the verified ship explicitly making reference to the speed power curves of the tank tested ship model
- Witnessing protocol of the tank tested ship endorsed by the surveyor of the Witnessing Society
- Towing tank test report of the tank tested ship

- On specific request of TL, the following additional information is to be submitted:

  - Ship lines and model particulars, loading and operating conditions of the tank tested ship as described in 4.2.7.2 of IMO "2014 Guidelines on Survey and Certification of the Energy Efficiency Design Index (EEDI)" as amended, showing that the verified ship and the tank tested ship are of the same type

- If some of the relevant information is held by the original Witnessing Society, the submitter should authorize the Witnessing Society to make the information available to TL.

Towing tank tests of a new ship performed before the entry into force of MARPOL Annex VI amendments introducing the EEDI have not been witnessed by a Verifier. In this case, towing tank test results provided by a tank test organization with quality control certified according to a recognized scheme or with experience acceptable to TL may be accepted by TL.

...

ADDITIONAL RULE – UNIFIED INTERPRETATIONS FOR THE IMPLEMENTATION OF MARPOL ANNEX VI AND NOX TECHNICAL CODE

01. General

Revision Date: January 2016

Entry into Force Date: July 2016

New UI MPC112, UI MPC113 and UI MPC118 have been incorporated into TL Additional Rule for Unified Interpretations for the Implementation of MARPOL Annex VI and NOx Technical Code.

Revision Date: February 2016

Entry into Force Date: July 2016

New UI MPC106, UI MPC108, UI MPC109, UI MPC110, UI MPC111, UI MPC114, UI MPC115, UI MPC116, UI MPC117, UI MPC120, UI MPC122, UI MPC123, UI MPC125 and UI MPC126 have been incorporated into TL Additional Rule for Unified Interpretations for the Implementation of MARPOL Annex VI and NOx Technical Code.

ADDITIONAL RULE – UNIFIED INTERPRETATIONS FOR LIFE SAVING APPLIANCES

01. General

Revision Date: January 2016

Entry into Force Date: July 2016

TL Additional Rule Unified Interpretations for Life Saving Appliances is revised as per UI SC267 Rev.1 as follows:

SC
267
(Rev.1 Jan 2016)
Implementation of the requirements relating to lifeboat release and retrieval systems (LSA Code Paragraph 4.4.7.6 as amended by resolution MSC.320(89))
...
For operating cables covered with sheath and installed inside the lifeboat, inner cables made of austenitic stainless steels 304 are acceptable without the corrosion test above.
...
Note
1.This Unified Interpretation is to be uniformly implemented for approvals issued in accordance with SOLAS III/34 and the LSA Code on or after 1 January 2016.
2. Revision 1 of this Unified Interpretation is to be uniformly implemented by IACS Societies for approvals issued in accordance with SOLAS III/34 and the LSA Code no later than 1 July 2016.

ADDITIONAL RULE – TYPE TESTING PROCEDURE FOR CRANKCASE OIL MIST DETECTION AND ALARM EQUIPMENT

01. General

Revision Date: March 2016

Entry into Force Date: July 2016

Additional Rule for Type Testing Procedure for Crankcase Oil Mist Detection and Alarm Equipment has been generally revised according to UR M67 Rev.2.

For further information:

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