TÜRK LOYDU RULE CHANGE SUMMARY

TL NUMBER: 02/2015 APRIL 2015

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 NOTICES

Chapter 101 – Naval Ship Technology, Classification and Surveys	
No	**Item**
01	**Section 2**
Chapter 102 – Naval Ship Technology, Hull Structures and Ship Equipment	
No	**Item**
01	**Section 14, B.4.2**
02	**Section 18, F.**
03	**Section 18, G.**
04	**Section 18, Table 18.1**
Chapter 106 – Naval Ship Technology, Automation	
No	**Item**
01	**Annex**

CHAPTER 101 – NAVAL SHIP TECHNOLOGY, CLASSIFICATION and SURVEYS

01. Section 2 – Class Designation

Revision Date: April 2015

Entry into Force Date: April 2015

Item C.3.1 has been revised as follows:

3.1.1 Depending on the requirements in the building specification, the following Notations may be assigned if the conditions defined in, Chapter 106 - Automation, Section 2 are fulfilled.

AUT-N The machinery installation is fitted with equipment needed to ensure safe operation of the engines and systems without any intervention for operation and/or maintenance by the crew over a period of at least 24 hours.

AUT-Nnh The machinery installation is fitted with equipment needed to ensure safe operation of the engines and systems without any intervention for operation and/or maintenance by the crew over a period of at least n hours.

AUT-C(NS) Automation-Centralized Control Station- This notation may be assigned when the automated equipment can be controlled and monitored from a central control station as referenced in TL Chapter 106, Section 2, A.3.

3.1.2 For ships equipped with arrangements such that the control and supervision of the ship operational functions are computer based, ICC Notation is assigned. For this purpose Chapter 105 - Naval Ship Technology - Electrical Installations - Section 10, ISO IEC 60182 FMEA and applicable provisions of Chapter 106 - Naval Ship Technology - Automation - Annex shall be complied with.

Revision Date: April 2015

Entry into Force Date: April 2015

Item C.4.1 has been revised as follows:

4. Other Special Equipment and Installations

4.1 Hull Notations ~~for Flight Operations~~

4.1.1 Hull Notations for Flight Operations

...

4.1.2 Protective Coating

PCWBT Protective Coating in Water Ballast Tanks - This notation will be assigned to indicate that the ship's seawater ballast tanks are provided with a corrosion protection system using by coatings according to TL Chapter 1, Section 22, A.7.1.

Revision Date: April 2015

Entry into Force Date: April 2015

Item C.4.2.1 has been revised as follows:

The class notation LA will, in general, be assigned for a classed ship as a mandatory class notation where the lifting appliance is considered to be an essential feature.

LA (CL) Cargo Lift – This notation is assigned in compliance with Chapter 107 - Naval Ship Technology, Ship Operation Installations and Auxiliary Systems- Section 3 E.2.2 to ships having lifts to be used for transporting military supplies.

LA (CR) Cargo Ramp - This notation is assigned in compliance with Chapter 107- Naval Ship Technology, Ship Operation Installations and Auxiliary Systems- Section 3 G to ships having movable ship borne vehicle ramps moved and/or used for loading/unloading in calm water.

LA (PL) Passenger Lift - This notation is assigned in compliance with Chapter 107- Naval Ship Technology, Ship Operation Installations and Auxiliary Systems- Section 3 E.2.1 to ships having passenger lifts that are designated to transport crew members or embarked troops.

LI Loading Instrument - This notation will be assigned where an approved loading instrument has been installed either as a Class or Owner's requirement.

As a supplement to the approved documentation for intact and damage stability and longitudinal strength (both for intact and damage condition) and torsional moments and lateral loads, where applicable; a loading instrument, approved by TL, is to be provided to facilitate calculations for the intact and damage stability and longitudinal strength (both for intact and damage condition) and torsional moments and lateral loads, where applicable.

General Provisions are settled in Part A Chapter 1 Hull Section 6 H. Loading Guidance Information and Section 26 F. Onboard Stability Instruments.

Revision Date: April 2015

Entry into Force Date: April 2015

New items as C.4.2.10, C.4.2.11 and C.4.3 have been added as follows:

4.2.10 Towing Arrangements

TA1 (TA2, TA3) Towing Arrangements - This notation will be assigned when an appraisal has been made of the towing arrangements and strength performance of the supporting structures in accordance with Chapter 102, Section 18, G.2.3.6 ÷ G.2.3.14.10. This notation recognises the least severe weather conditions, see Chapter 102, Section 18, Table 18.3.

4.2.11 Manoeuvring Capability Assessment

MCA Manoeuvring Capability Assessment – For the assignment of the MCA notation, the ship is to be assessed in accordance with the requirements of IMO Res.MSC 137(76). IMO Res.A 601(15) and MSC Circ.1053 are also to be taken into consideration. In cases where a large displacement ship does not satisfy the stopping standard referred above, ship's stopping capability will be specially considered.

Model test reports may be accepted instead of calculations provided that they reflect all required conditions.

4.3 Notations for Electrical Installations

ELS Quality of Electrical Power Supplies – This notation will be assigned to indicate that the mains quality of the electrical power supply are complied with the requirements of NATO Standardization

Agreement (STANAG) 1008 as referenced in TL Chapter 105, Section 1, F.2.1. It also shows that the installation has been arranged, installed and tested in accordance with TL Rules.

Revision Date: April 2015

Entry into Force Date: April 2015

Table 2.2 has been revised as follows:

Table 2.2 Summary of notations for naval ships (1)

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, 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** **SUBMARINE** Special types, e.g.: **HYDROFOIL** **CATAMARAN** **WATER JET** High speed craft: **HSC-N** **HSDE** Auxiliary ship-Navy: **AUX-NH** **AUX-NM** Certificate of Conformity: **CoC** IACS Common Structural Rules: **CSR** Naval Ship Code: **NSC** Submersible: **U**	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** Novel design: **EXP** Emergency response service: **ERS** Service range: **Y** **K50/K20** **K6** Towing arrangement: **TA1 (TA2, TA3)**	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: **AIP-xxx** **with AIP**	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**

(1) *For **PCWBT** Notation, see TL Rules Chapter 1 Hull Section 22 A.7.1. For **LI** Notation, see TL Rules Chapter 1 Hull Section 6 H and Section 26 F. For **MCA** Notation, see IMO Res.MSC 137(76), IMO Res.A601(15) and MSC Circ.1053.*

CHAPTER 102 – NAVAL SHIP TECHNOLOGY, HULL STRUCTURES and SHIP EQUIPMENT

01. Section 14 – Foundations, Hatchways and Hatchcovers

Revision Date: April 2015

Entry into Force Date: April 2015

Item B.4.2 has been revised as follows:

4.2 ~~For windlasses and chain stoppers the acting forces on the foundation are to be calculated for 100% of the nominal breaking load of the chain cable.~~

~~For the supporting structure under this equipment 100% of the minimum yield stress R_{eH} is to be observed as acceptance criterium in the calculation.~~ For the supporting structure under windlasses and chain stoppers, the following permissible stresses are to be observed:

bending stress : $\sigma_b = \frac{200}{k}$ [N/mm^2]

shear stress : $\tau = \frac{120}{k}$ [N/mm^2]

equivalent stress : $\sigma_V = \sqrt{\sigma_b^2 + 3\tau^2} = \frac{220}{k}$ [N/mm^2]

The acting forces are to be calculated for 80 % and 45 % respectively of the rated breaking load of the chain cable, i.e.:

for chain stoppers 80 %

for windlasses 80 %, where chain stoppers are not fitted.

45 %, where chain stoppers are fitted.

02. Section 18 – Anchoring and Mooring Equipment

Revision Date: April 2015

Entry into Force Date: April 2015

Item F. is revised as follows:

~~**F. Mooring Equipment**~~

~~**1. Ropes**~~

~~**1.1** The tow lines and mooring ropes specified in Table 18.1and the content of 1.2 and 1.3 are~~

recommendations only, compliance with these items is not a condition of Class.

1.2 Breaking load

For tow lines and mooring lines, steel wire ropes as well as fibre ropes made of natural or synthetic fibres or wire ropes consisting of steel wire and fibre cores may be used. Nominal breaking loads specified in Table 18.1 are valid for wire ropes only. Where ropes of synthetic fibre are used, the breaking load is to be increased above the table values. The extent of increase depends on the material quality.

The required diameters of synthetic fibre ropes used in lieu of steel wire ropes may be taken from Table 18.2.

Regardless of the breaking load recommended in Table 18.1, the diameter of fibre ropes should not be less than 20 mm.

1.3 Type of wire ropes

Wire ropes shall be of the following type:

- 144 wires (6 x 24) with 7 fibre cores for breaking loads of up to 500 kN type: Standard

- 216 wires (6 x 36) with 1 fibre core for breaking loads of more than 500 kN type: Standard

Where wire ropes are stored on mooring winch drums, steel cored wire ropes may be used e.g.:

- 6x19 with 1 steel core type: Seale

- 6 x 36 with 1 steel core type: Warrington-Seale

1.4 Length

The length of the individual mooring ropes may be up to 7 per cent less than that given in Table 18.1, provided that the total length of all the wires and ropes is not less than the sum of the required individual lengths.

1.5 Alternatives

For individual mooring lines with a breaking load above 500 kN the following alternatives may be applied:

- The breaking load of the individual mooring lines specified in Table 18.1 may be reduced with corresponding increase of the number of mooring lines, provided that the total breaking load of all lines aboard ship is not less than the rule value as per Table 18.1. No mooring line, however should have a breaking load of less than 500 kN.

- The number of mooring lines may be reduced with corresponding increase of the breaking load of the individual mooring lines, provided that the total breaking load of all lines aboard ship is not less than the rule value specified in Table 18.1; however, the number of lines should not be less than 6.

2. Mooring winches, capstans, bollards, hawses

2.1 Mooring winches and capstans are to be designed taking into account the actual mooring lines and 80 % of their nominal breaking loads. Substructures are to be dimensioned according to Section 14, B.4.

~~**2.2** Hawses, bollards and cleats shall be so designed as to protect the ropes against excessive wear.~~

~~They are to be of proved construction and shall comply with relevant standards.~~

~~*Note:*~~

~~Attention is drawn to relevant National Standards.~~

~~**2.3** Hawses, bollards, cleats and their substructures are to be strengthened, if they are intended to be belayed by multiple lines. In this case 80 % of the nominal breaking load of the individual lines has to be used as pulling force.~~

F. Mooring and Towing Equipment

1. Mooring Lines and Towing Lines

1.1 The mooring lines and towing line are given in Table 18.1 and are based in an equipment number EN calculated in compliance with B.1.

1.2 The towing lines given in col. 8 of Table 18.1 are intended as own towline of a ship to be towed by a tug or other ship.

1.3 Mooring lines and towing lines are given as guidance only.

2. Specifications of Mooring and Towing Ropes

2.1 Mooring lines and towlines may be of steel wire, natural fibre or synthetic fibre construction or of a mixture of steel wire and fibre. The lengths of individual mooring ropes may be reduced by up to 7% of the table length, provided that the total length of mooring ropes is not less than would have resulted had all ropes been of equal length.

2.2 Notwithstanding the strength requirements given in Table 18.1, no fibre rope is to be less than 20 mm diameter.

2.3 Wire ropes

2.3.1 Where wire ropes are used, they are to be of a flexible construction with not less than:

- 72 wires in 6 strands with 7 fibre cores for the loads up to 216 kN

- 144 wires in 6 strands with 7 fibre cores for the loads of 216 kN to 490 kN

- 216 wires in 6 strands with 1 fibre cores for loads exceeding 490 kN.

2.3.2 Tensile strength of wires for wire rope mooring lines is to be within the following ranges:

1420 - 1570 N/mm^2

1570 - 1770 N/mm^2

1770 - 1960 N/mm^2

2.3.3 Wire ropes for use in association with mooring winches where the rope is to be stored on the drum may be constructed with an independent wire rope core instead of fibre core.

2.4 The required diameters of synthetic fibre ropes used in lieu of steel wire ropes may be taken from Table 18.2.

03. Section 18 – Anchoring and Mooring Equipment

Revision Date: April 2015

Entry into Force Date: April 2015

A new item as "G." has been added as follows:

G. Shipboard Fittings and Supporting Hull Structures Associated With Mooring and Towing

1. Mooring

1.1 Strength

The strength of shipboard fittings used for mooring operations and their supporting hull structures are to comply with the requirements of this subsection.

1.2 Arrangement

Shipboard fittings for mooring are to be located on longitudinal, beams and/or girders, which are part of the deck construction so as to facilitate efficient distribution of the mooring load. Other arrangements may be accepted (for Panama chocks, etc.) provided the strength is confirmed adequate for the service.

1.3 Load considerations

1.3.1 Unless greater safe working load (SWL) of shipboard fittings is specified by the applicant, the design load applied to shipboard fittings and supporting hull structures is to be 1.25 times the breaking strength of the mooring line according to Table 18.1.

Note :

Side projected area including maximum stacks of deck cargoes is to be taken into account for assessment of lateral wind forces, arrangements of tug boats and selection of mooring lines.

1.3.2 The design load applied to supporting hull structures for winches, etc. is to be 1.25 times the intended maximum brake holding load and, for capstans, 1.25 times the maximum hauling-in force.

1.3.3 The design load is to be applied through the mooring line according to the arrangement shown on the towing and mooring arrangement plans.

1.3.4 The method of application of the design load to the fittings and supporting hull structures is to be taken into account such that the total load need not be more than twice the design load specified in 1.3.1 above, i.e. no more than one turn of one line (see figure 18.2).

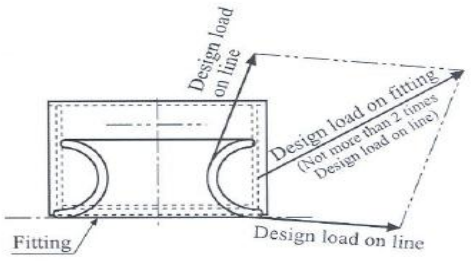

Figure 18.2 Application of design loads

1.3.5 When a specific SWL is applied for a shipboard fitting at the request of the applicant, by which the design load will be greater than the above minimum values, the strength of the fitting is to be designed using this specific design load.

1.4 Shipboard fittings

The selection of shipboard fittings is to be made by the shipyard in accordance with an industry standard (e.g. ISO 13795 Ships and marine technology – Ship's mooring and towing fittings – Welded steel bollards for sea-going vessels) accepted by TL. When the shipboard fitting is not selected from an accepted industry standard, the design load used to assess its strength and its attachment to the ship is to be in accordance with 1.3.

1.5 Supporting hull structure

1.5.1 Arrangement

Arrangement of the reinforced members beneath shipboard fittings is to consider any variation of direction (horizontally and vertically) of the mooring forces (which is to be not less than the design load as per 1.3) acting through the arrangement of connection to the shipboard fittings.

1.5.2 Acting point of mooring force

The acting point of the mooring force on shipboard fittings is to be taken at the attachment point of a mooring line or at a change in its direction.

1.5.3 Allowable stresses

Allowable stresses under the design load conditions as specified in 1.3 are as follows:

Normal stress: 100% of the specified minimum yield point of the material.

Shearing stress: 60% of the specified minimum yield point of the material.

No stress concentration factors being taken into account. Normal stress is the sum of bending stress

and axial stress with the corresponding shearing stress acting perpendicular to the normal stress.

1.6 Safe working load (SWL)

1.6.1 The SWL is not to exceed 80% of the design load per 1.3.

1.6.2 The SWL of each shipboard fitting is to be marked (by weld bead or equivalent) on the deck fittings used for mooring.

1.6.3 The above requirements on SWL apply for a single post basis (no more than one turn of one cable).

1.6.4 The towing and mooring arrangements plan mentioned in 3. is to define the method of use of mooring lines.

1.7 Net thickness (t_{net})

Strength calculations for supporting hull structures of mooring equipment are to be based on net thicknesses.

$t_{net} = t - t_k$

t_k = Corrosion addition according to G.4.

2. Towing

2.1 Strength

The strength of shipboard fittings used for normal towing operations at bow, sides and stern and their supporting hull structures are to comply with the requirements of this subsection.

2.2 Shipboard fittings for towing are to be located on longitudinals, beams and/or girders, which are part of the deck construction so as to facilitate efficient distribution of the towing load. Other arrangements may be accepted (for Panama chocks, etc.) provided the strength is confirmed adequate for the intended service.

2.3 Load considerations

Unless greater safe working load (SWL) of shipboard fittings is specified by the applicant, the minimum design load to be used is the following value of 2.3.1 or 2.3.2, whichever is applicable:

2.3.1 For normal towing operations (e.g. harbour) 1.25 times the intended maximum towing load (e.g. static bollard pull) as indicated on the towing and mooring arrangements plan.

2.3.2 For other towing service (e.g. escort), the nominal breaking strength of the tow line according to Table 18.1 for the equipment numeral EN.

Note:

Side projected area including maximum stacks of deck cargoes is to be taken into account for assessment of lateral wind forces, arrangements of tug boats and selection of towing lines.

2.3.3 The design load is to be applied through the tow line according to the arrangement shown on the towing and mooring arrangements plan.

2.3.4 The method of application of the design load to the fittings and supporting hull structures is to be taken into account such that the total load need not be more than twice the design load (see figure 18.2).

2.3.5 When a specific SWL, is applied for a shipboard fitting at the request of the applicant, by which the design load will be greater than the above minimum values, the strength of the fitting is to be designed using this specific design load.

2.3.6 Ships complying with the requirements of this section will be eligible to be classed with the notation TA1, TA2 or TA3.

2.3.7 TA1, TA2 and TA3 notations will be assigned when an appraisal has been made of the towing arrangements and strength performance of the supporting structures in accordance with the Rules for considering the severe weather conditions, see Beaufort scale given in Table 18.3.

2.3.8 These three levels of towing arrangements in 2.3.7 recognise towing a ship of similar displacement at 6 knots in defined environmental conditions.

2.3.9 In case of alternative requirements to the breaking load of the towing hawser required by 2.3.14.1 are specified, and have been complied with, the ship will be entitled to the notation TA(NS). These alternative requirements are to be clearly defined and referenced in the Certificate of Class. The load specified in the alternative is to replace the BL value given by the expression in 2.3.14.1.

2.3.10 Where the towline complies with the strength requirements of Table 18.1 as applicable to merchant ships for the related equipment number, the ship will be entitled to the assignment of the TA(S) notation. The breaking load specified in Table 18.1 is to replace the BL value given by the expression in 2.3.14.1.

2.3.11 Towing operations are to be in accordance with the towing, mooring and arrangements plan or equivalent information which is required to be placed on board. See 2.3.12.

Table 18.3 Design weather factors / Environmental conditions

Applicable notation	Wind speed coefficient, C_{mw}	Weather factor, K	Beaufort Scale	Equivalent Mean Wind Speed (knots)
TA1	0,0150	8	10+	48+
TA2	0,0129	7,2	9	41-47
TA3	0,0108	6,3	8	34-40

2.3.12 Information Required

2.3.12.1 Plans are to be of sufficient detail for plan approval purposes. Plans covering the following items are to be submitted for approval:

- Strong points, bollards and fairleads, see 2.3.13.7.
- Support structure and foundations of towing equipment.

2.3.12.2 The towing arrangement plan is to be submitted for information. It is to include the following in respect of each shipboard fitting:

- Location on the ship.
- Fitting type.
- Safe working load (SWL).
- Manner of applying towing line load, including limiting fleet angles.

The towing arrangement plan is to be provided on board the ship for the guidance of the Master.

2.3.13 Towing Arrangements

2.3.13.1 A towing arrangement is to be provided at both the fore and aft end of the ship.

2.3.13.2 The fixed towing equipment is to comprise a securing arrangement which is a strong point and may be in the form of a stopper bollard, bracket, deck clench or towing slip. A fairlead, rollers or other appropriate towline guides as necessary are to be included in the arrangement.

2.3.13.3 Loose towing equipment is to comprise a towing hawser and a towing pennant. The towing pennant may comprise a length of chafing chain. In the absence of a length of chafing chain suitable arrangements (e.g. a low friction sheath) are to be provided.

2.3.13.4 Fairleads and guides are to be designed so as to prevent excessive bending stress in the towing hawser, towing pennant or chafing chain, whichever is applicable. The bending ratio of the guides bearing surface to the diameter of the applicable towline element is not to be less than 7 to 1. For fibre rope towing hawsers and towing pennants the bending ratio is to comply with the rope manufacturer's specification.

2.3.13.5 The fairlead or guide is to have an opening large enough to allow the passage of the largest element of the loose towing equipment.

2.3.13.6 The fairlead or guide is to be fitted as close to the deck as practicable and in a position so that the tow will be approximately parallel to the deck when under tension between the strong point and the guide.

2.3.13.7 The selection of shipboard fittings is to be made by the shipyard in accordance with an acceptable National or International standard. If the shipboard fitting is not selected from an acceptable National or International standard then the design load used to assess its strength and its attachment to the ship is to be in accordance with the design load given in 2.3.14.3. The design is to be submitted for approval.

2.3.13.8 Deck fittings and strong points are to be located on longitudinals, beams and/or girders, which are part of the deck construction so as to facilitate efficient distribution of the towing load. Other equivalent arrangements will be considered, providing the strength is confirmed as adequate for the intended use.

2.3.13.9 To avoid chafing, the arrangement is to be designed so that no element of the loose towing equipment, when under tension, is to contact with the ship's hull at any point other than those specified as a securing arrangement, fairlead or guide. The final point of contact of the towline with the ship is to be positioned as close as practicable to the centre line so as to reduce the adverse effect on manoeuvrability.

2.3.13.10 The chafing arrangement is to extend a minimum of 3 m outboard of the fairlead or guide when in the deployed position and 2 m inboard.

2.3.13.11 The loose towing equipment is to be located as near as practicable to the strong point and is to be designed to be capable of being rigged and deployed in the absence of power. It is recommended that extra loose gear meeting the requirements of this Section be carried on board to provide for redundancy.

2.3.13.12 The minimum length of the towing hawser is to be as given in Table 18.1.

2.3.13.13 The SWL of each shipboard fitting is to be clearly marked, by weld bead or equivalent, on each of the fittings used for towing, see 2.3.14.10.

2.3.14 Strength Requirements for Towing Arrangements

2.3.14.1 The minimum Breaking Load (hereinafter referred to as BL), of the towing hawser carried on board the ship is assessed, in tonnes, is not to be less than that calculated below:

$BL = (0{,}03\Delta^{2/3} + (C_{mw}A_t))\ K$

where

Δ = displacement, in tonnes, to the deep draught waterline

C_{mw} = wind speed coefficient, which is to be taken from Table 18.3 for the relevant notation

K = weather factor, which is to be taken from Table 18.3 for the relevant notation

A_t = transverse projected area, in m^2, of the hull and of all superstructures, houses, masts, etc. above the design draught

2.3.14.2 The strength of other loose towing equipment e.g., links, shackles rings and chafing chain is to be determined on the basis of a design load equal to 1,25 times the BL of the towing hawser.

2.3.14.3 The strength of shipboard fittings and their supporting structure is to be determined on the basis of a design load equal to 1,25 times the BL of the towing hawser. The design load is to be applied through the towline according to the arrangement shown on the towing arrangement plan. The point of action of the force on the fitting is to be taken as the point of attachment of the mooring line or towline or at a change in its direction. The total design load applied to a fitting need not be more than twice the design load, see Figure 18.2.

2.3.14.4 The stress in all loose and fixed towing equipment constructed of steel, and its supporting structure, is not to exceed the specified minimum yield stress of the material in bending and 60 per cent of the specified minimum yield stress of the material in shear. Special consideration will be given if the vessel and/or towing equipment is not constructed of steel.

2.3.14.5 The reinforced members (carling) beneath shipboard fittings are to be effectively arranged for any variation of direction (horizontally and vertically) of the towing forces (which is to be not less than the design load) acting through the arrangement of connection to the shipboard fittings. Other arrangements will be specially considered provided that the strength is confirmed as adequate for the service.

2.3.14.6 For the assessment of fairleads and their supporting structure, due consideration is to be given to lateral loads. The strength of the fairlead is to be sufficient for all angles of towing load up to 90° horizontally from the ship's centreline and 30° vertically from the horizontal plane.

2.3.14.7 For the assessment of a strong point and its supporting structure, the applied load is to be in the direction that the towing pennant or towing hawser will take up during normal deployment. It is also to be applied at the maximum height possible above the deck for that specific type of strong point.

2.3.14.8 The structural arrangements of strong points, bollards and fairleads are to be such that continuity will be ensured. Abrupt changes in section; sharp corners and other points of stress concentration are to be avoided.

2.3.14.9 Strong points are to be fitted in way of a transverse or longitudinal deck girder or beam to facilitate efficient distribution of the towing load.

2.3.14.10 The SWL of each towing arrangement component is to be no greater than 80 per cent of the design load applied.

2.4 Shipboard fittings

The selection of shipboard fittings is to be made by the shipyard in accordance with an industry standard (e.g. ISO 13795 Ships and marine technology – Ship's mooring and towing fittings – Welded steel bollards for sea-going vessels) accepted by TL. When the shipboard fitting is not selected from an accepted industry standard, the design load used to assess its strength and its attachment to the ship is to be in accordance with 2.3.

2.5 Supporting hull structure

2.5.1 Arrangement

The reinforced members beneath shipboard fittings are to be effectively arranged for any variation of direction (horizontally and vertically) of the towing forces (which is to be not less than the design load as per 2.3) acting through the arrangement of connection to the shipboard fittings.

2.5.2 Acting point of towing force

The acting point of the towing force on shipboard fittings is to be taken at the attachment point of a towing line or at a change in its direction.

2.5.3 Allowable stresses

Allowable stresses under the design load conditions as specified in 2.3 are as follows:

Normal stress: 100% of the specified minimum yield point of the material.

Shearing stress: 60% of the specified minimum yield point of the material.

No stress concentration factors being taken into account. Normal stress is the sum of bending stress and axial stress with the corresponding shearing stress acting perpendicular to the normal stress.

2.6 Safe working load (SWL)

2.6.1 The SWL used for normal towing operations is not to exceed 80% of the design load per 2.3.1 and SWL used for other towing operations is not to exceed the design load per 2.3.2. For fittings used both normal and other towing operations, the greater of the design loads of 2.3.1 and 2.3.2 is to be used.

2.6.2 The SWL of each shipboard fitting is to be marked (by weld bead or equivalent) on the deck fittings used for towing.

2.6.3 The above requirements on SWL apply for a single post basis (no more than one turn of one cable).

2.6.4 The towing and mooring arrangements plan mentioned in 3. is to define the method of use of towing lines.

3. Towing and Mooring Arrangements Plan

3.1 The SWL for the intended use for each shipboard fitting is to be noted in the towing and mooring arrangements plan available on board for the guidance of the Master.

3.2 Information provided on the plan is to include in respect of each shipboard fitting:

- Location on the ship,

- Fitting type,

- SWL,

- Purpose (mooring/harbour towing/escort towing); and,

- Manner of applying towing or mooring line load including limiting fleet angles.

This information is to be incorporated into the pilot card in order to provide the pilot proper information on harbour/escorting operations.

4. Corrosion Addition

The total corrosion addition, t_K, in mm. for both sides of the hull supporting structure is not to be less than 2,0 mm.

5. Surveys After Construction

The condition of deck fitting, their pedestals, if any, and the hull structures in the vicinity of the fittings are to be examined in accordance with TL Rules. The wastage allowances as specified by TL Rules are not to exceed the corrosion addition as specified in 4.

04. Section 18 – Anchoring and Mooring Equipment

Revision Date: April 2015

Entry into Force Date: April 2015

Table 18.1 has been revised as follows:

Table 18.1 Anchors, chain cables and ropes

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]
1	2	3	4	5	6	7	8	9	10	11	12
2700-2870	8300	632.5	92	81	70	-	260	1470	6	200	490
2870-3040	2870-30	632.5	95	84	73	-	~~2870~~ 280	1470	6	200	500
3040-3210	9300	660	97	84	76	-	280	1470	6	200	520
3210-3400	9900	660	100	87	78	-	280	1470	6	200	555
3400-3600	10500	660	102	90	78	-	300	1470	6	200	590
3600-3800	11100	687.5	105	92	81	-	~~3600~~ 300	1470	6	200	620
3800-4000	11700	687.5	107	95	84	-	~~3000~~ 300	1470	6	200	650

(1) *d_1 = Chain diameter Grade K 1 (Ordinary quality)*
d_2 = Chain diameter Grade K 2 (Special quality)
d_3 = Chain diameter Grade K 3 (Extra special quality)
d_4 = Chain diameter for non-magnetizable austenitic steel (WN 1.3964)

CHAPTER 106 – NAVAL SHIP TECHNOLOGY, AUTOMATION

01. Annex

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Entry into Force Date: April 2015

New section as “Annex” has been added into the rules in order to define ICC notation requirements.

For further information:

Kemal AKŞAR

Head of Department, Research & Rule Development

TÜRK LOYDU PLAN CONTROL & RESEARCH DIVISION

Tel: +90- 216 581 38 84

Fax: +90- 216 581 38 40

E-mail: kaksar@turkloydu.org

Web: www.turkloydu.org

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