Amendments to the "Rules for the Classification of Floating Docks"

Effective from 1/7/2025

List of the amendments:

Chapter/Paragraph amended	Reason
Ch 4, [2.1.4](new), [2.1.5](renumbered 2.1.6)	to clarify the applicability of weather criteria, including the introduction of requirements for the wind heeling moment calculation, considering the operational profile of floating docks in restricted waters (Prop. 289)
Ch 5, [1.2](new)	to introduce a minimum height requirement for air pipes (Prop. 289)

CHAPTER 4 HULL, STABILITY AND MATERIALS

1 General

1.1 Foreword

1.1.1 These requirements apply, if not otherwise specified, to docks intended to operate in sheltered areas.

Docks for which service in non-sheltered areas is anticipated will be subject to special consideration.

With respect to structural conformation, floating docks may, in general, be subdivided into the following types:

a) Continuous pontoon and walls dock.

b) Continuous walls and non-continuous pontoon dock.

c) Continuous pontoon and non-continuous walls or towers dock.

d) Non-continuous pontoon and walls dock.

The above docks may or may not be self-docking.

In any case, TASNEEF reserves the right to decide on the appli- cability of these requirements with respect to the particular structural conformations and service characteristics of the dock.

1.2 Definitions and symbols

1.2.1 Pontoon

The pontoon is the structure extending below and between the wing walls and forming the lower part of the dock.

1.2.2 Buoyancy tanks

The buoyancy tanks are watertight compartments, constructed to be empty at all times and hence not provided with any flooding system.

1.2.3 Block Deck or Floor

The block deck or floor is the deck on which blocks are located; in general, it coincides with the upper surface of the pontoon.

1.2.4 Upper deck

The upper deck is the deck joining the top parts of wings of each wall, over all their length.

1.2.5 Safety deck

The safety deck is the lowest watertight deck located above all the ballast tanks and extending over all the length of the dock.

1.2.6 Length

a) The length L_c (in m) is the maximum length between the end bulkheads of the part of the dock contributing to buoyancy

b) The length L_{ft} (in m) is the overall length of the dock, including platforms, if any.

1.2.7 Breadth

a) The breadth B (in m) is the maximum horizontal distance measured between the outer surfaces of the walls of the part of the dock contributing to buoyancy.

b) The breadth B_m (in m) is the maximum free distance of the pontoon measured in line with the block deck.

c) The breadth B_u (in m) is the maximum available breadth, measured between the internal surfaces of the walls or between possible fixed protrusions.

1.2.8 Depth

a) The depth D (in m) is the maximum vertical distance from the moulded line to the upper deck.

b) The depth D_p (in m) is the vertical distance measured at 0,5 L_c on the external wing wall from the moulded line to the block deck, theoretically extended, if applicable, up to the outer wall.

1.2.9 Draft

a) The draft l_u (in m) is the distance from the top of the blocks to the waterline corresponding to Bli.

b) The draft l_{max} (in m) is the distance from the moulded line to the waterline corresponding to Bli.

c) The draft l_{min} (in m) is the draft when the dock is in vacant condition.

d) The draft l_{lma} (in m) is the maximum working draft.

e) The draft l_{lmi} (in m) is the minimum working draft.

1.3 Documentation to be submitted

1.3.1 For each dock for which supervision during construction is required, documents and details as per Tab 1 are to be submitted to TASNEEF for approval in three copies.

Where considered necessary, TASNEEF may request the submis- sion of further documents and details.

If composite materials are employed, irrespective of the presence of pre-induced stress conditions on structures (structures in reinforced concrete, pre-compressed reinforced concrete, pre-stressed structures, etc.), in addition to the documents indicated in Tab 1, drawings of frames and pre-stressing systems of the various parts, together with the supporting calculations, are to be submitted for approval.

Table 1 : Documentation to be submitted

Document	Document details
Midship Section Scantling plan	• required class characteristics • openings on decks and shell • corrosion protection • minimum and extreme drafts • loads on decks • block deck
Watertight subdivision bulkheads	openings, if any
Watertight and wash bulkheads of ballast tanks	• location of air vents • tanks intended to be partially filled • procedures for tank filling and level and pressure control
Machinery foundations	mass of machinery
Details of section connections (constructional drawing)	
Wall shutters and similar	
General plan of external doors and scuttles	
General plan of ventilation and manholes	use of rooms
Arrangement for handling of loads Structure of load elevators	relevant hull stiffening
Sea water intakes and overboard discharges in general	
Hydrostatic test plan	
Pumping diagrams	
Stability calculations	

1.4 Operating Manual

1.4.1 An Operating Manual is to be prepared for each floating dock, describing the operating condition.

In addition to the characteristic elements of the floating dock itself, the Manual, to be sent for information to TASNEEF, is to report the basic data assumed for the strength calcula- tions (design lifting capacity, load distribution, etc.) and information for verification of stability in the various opera- tive conditions.

2 General requirements for design

2.1 Stability

2.1.1 General

Floating docks having a length equal to or greater than 24 m are to be provided with suitable transverse stability charac- teristics complying with the requirements of this item [2.1].

2.1.2 Loading conditions

Stability calculations are to analyse the most severe opera- tive conditions, taking into account the heaviest weight positions, including hanging loads and the possible effects of free surfaces of liquids in tanks.

In particular, for dry docks, the loading conditions which consider water levels lapping the top edge of the block deck and the top part of the blocks themselves are to be consid- ered.

Moreover, TASNEEF may, at its discretion, request to carry out a stability calculation for the case of an emerged floating dock with displacement as close as possible to full load dis- placement, with a flooded compartment, eccentric and at one end of the dock, i.e. selected among those involving the most severe conditions from the point of view of stabil- ity.

2.1.3 Intact stability requirements

In general, for dry docks the initial metacentric transversal height GM0 of the system ship plus dry dock, considering all the corrections for liquid free surface effects, is to be not less than 1,5 m for docks with design lifting capacity up to 10000 t.

The above-mentioned metacentric height may be linearly reduced for lifting capacities over 10000 t, up to a mini- mum of 1,0 m for lifting capacities equal to 50000 t or above.

2.1.4 **Wind heeling moment** *(1/7/2025)*

The wind heeling moment is to be calculated from the following formula:

$$0{,}625 \cdot 10^{-4} \cdot V^2 AH \text{ (t m)}$$

Where:

<u>A: the longitudinal projected area of the exposed surface considered at every stage of inclining exposed areas of docked ship (m^2).</u>

<u>H=ΔH + 0,5 d (m)</u>

<u>ΔH: Vertical distance from the center of A to the water line of the dock (m).</u>

<u>d: draught of the dock (m)</u>

<u>V: wind velocity (m/s), the wind velocity is not to be less than 25 m/s in general.</u>

<u>However, the values of the wind velocity depend on the service location and the mode of operation of the dock, and may be considered more precisely in each case.</u>

<u>In general, the point of intersection between the statical stability curve and the wind heeling moment curve is under no circumstance to exceed the angle where any part of the poonton deck or downflooding point submerged.</u>

2.1.5 Severe wind and rolling criterion (weather criterion)

a) Assumptions

The ability of a floating dock to withstand the combined effects of beam wind and rolling is to be demonstrated for each standard condition of loading, with reference to Fig 1 as follows:

- the dock is subjected to a steady wind pressure acting perpendicular to the dock's centreline which results in a steady wind heeling lever (ℓ_{w1});

- from the resultant angle of equilibrium (θ_0), the dock is assumed to roll owing to wave action to an angle of roll (θ_1) to windward;

- the dock is then subjected to a gust wind pressure which results in a gust wind heeling lever (ℓ_{w2});

- free surface effects are to be accounted for in the standard conditions of loading.

Figure 1 : Severe wind and rolling
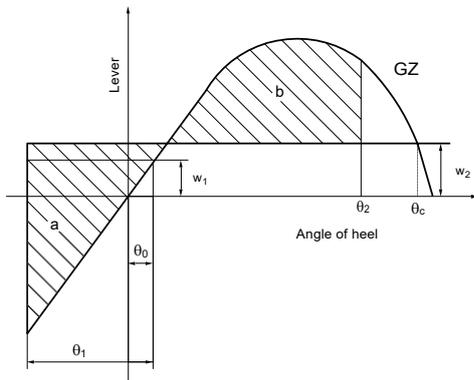
b) Criteria

Under the assumptions of a) above, the following criteria are to be complied with:

- the area "b" is to be equal to or greater than the area "a",

    where:

a   :   Area above the GZ curve and below ℓ_{w2}, between θ_R and the intersection of ℓ_{w2} with the GZ curve

b   :   Area above the heeling lever ℓ_{w2} and below the GZ curve, between the intersection of ℓ_{w2} with the GZ curve and θ_2.

- the angle of heel under action of steady wind (θ_0) is to be limited to 16° or 80% of the angle of deck edge immersion, whichever is the lesser.

c) Heeling levers

The wind heeling levers ℓ_{w1} and ℓ_{w2}, in m, referred to in b) above, are constant values at all angles of inclination and are to be calculated as follows:

$$\ell_{w1} = \frac{PAZ}{1000g\Delta}$$

and

$$\ell_{w2} = 1,5 \; \ell_{w1}$$

where:

P   : 504 N/m^2

The value of P used for docks positioned in protected locations may be reduced subject to the approval of TASNEEF

A   :   Projected lateral area, in m^2, of the portion of the dock and deck cargo above the waterline;

Z   :   Vertical distance in m, from the centre of A to the centre of the underwater lateral area or approximately to a point at one half the draught;

Δ : Displacement, in t;

g   : 9,81 m/s^2.

d) angles of heel:

For the purpose of calculating the criteria of b) above, the angles in Fig 1 are defined as follows:

θ_0 :   Angle of heel, in degrees, under action of steady wind

θ_1 :   Angle of roll, in degrees, to windward due to wave action, calculated as follows:

$$\theta_1 = 109kX_1X_2 \; \sqrt{rs}$$

θ_2 :   Angle of downflooding (θ_f) in degrees, either 50° or θ_c , whichever is the lesser

θ_f :   Angle of heel in degrees, at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open;

θ_c : Angle in degrees, of second intercept between wind heeling lever ℓ_{w2} and GZ curves

$\theta_R = \theta_0 = \theta_1$

x_1 : Coefficient defined in Tab 2

x_2 : Coefficient defined in Tab 3

k : Coefficient

    k = 1,0 for a round-bilged dock having no bilge or bar keels

    k = 0,7 for a dock having sharp bilge

    For a dock having no bilge keels, a bar keel or both, k is defined in Tab 4.

DG : Distance in m, between the centre of gravity and the waterline (positive if centre of gravity is above the waterline, negative if it is below)

T_1 : Mean moulded draught in m, of the dock

s : Factor defined in Tab 5.

Note 1: The angle of roll θ_1 for docks with anti-rolling devices is to be determined without taking into account the operations of these devices.

Note 2: The angle of roll θ_1 may be obtained, in lieu of the above formula, from model tests or full scale measurements.

The rolling period T_R, in s, is calculated as follows:

$$T_R = \frac{2CB}{\sqrt{GM}}$$

where:

C = 0,373 + 0,023 B/T_1 - 0,043 I_w / 100

The symbols in the tables and formula for the rolling period are defined as follows:

L_W : Length, in m, of the dock at the waterline

T_1 : Mean moulded draught in m, of the dock

A_k : Total overall area, in m², of bilge keels, or area of the lateral projection of the bar keel, or sum of these areas, or area of the lateral projection of any hull appendages generating added mass during dock roll

GM : Metacentric height, in m, corrected for free surface effect.

Table 2 : Values of coefficient X_1

B/d	X_1
≤ 2,4	1,00
2,5	0,98
2,6	0,96
2,7	0,95
2,8	0,93
2,9	0,91
3,0	0,90
3,1	0,88
3,2	0,86
3,4	0,82
≥ 3,5	0,80

Note 1: Intermediate values are to be obtained by linear interpolation.

Table 3 : Values of coefficient X_2

C_r	X_2
≤ 0,45	0,75
0,50	0,82
0,55	0,89
0,60	0,95
0,65	0,97
≥ 0,70	1,00

Note 1: Intermediate values are to be obtained by linear interpolation.

Table 4 : Values of coefficient k

$\dfrac{A_K \times 100}{L \times B}$	k
0,0	1,00
1,0	0,98
1,5	0,95
2,0	0,88
2,5	0,79
3,0	0,74
3,5	0,72
$\geq 4,0$	0,70

Note 1: Intermediate values are to be obtained by linear interpolation.

Table 5 : Values of coefficient s

T_R	s
≤ 6	0,100
7	0,098
8	0,093
12	0,065

Note 1: Intermediate values are to be obtained by linear interpolation.

T_R	s
14	0,053
16	0,044
18	0,038
≥ 20	0,035

Note 1: Intermediate values are to be obtained by linear interpolation.

2.1.6 Stability booklet *(1/7/2025)*

Each floating dock is to be provided with a stability booklet, approved by TASNEEF, which contains sufficient information to enable the Master to operate the dock in compliance with the applicable requirements of this item [2.1].

In particular, the floating dock is to comply with the stability requirements in [2.1.3] and [2.1.4] for each loading condition. However, in case that the floating dock is subjected to transfer voyage, the requirements in [2.1.5] are also to be complied with.

Where any alterations are made to a dock so as to materially affect the stability information supplied to the Master, amended stability information is to be provided. If necessary the dock is to be reinclined.

Stability data and associated plans are to be drawn up in the official language or languages of the issuing country. If the languages used are neither English nor French the text is to include a translation into one of these languages.

The format of the trim and stability booklet and the information included are specified in App 2 of Chapter 3 of Part B of the Rules, as far as applicable.

CHAPTER 5   MACHINERY AND SYSTEMS

1 Machinery and piping systems

1.1 General

1.1.1 Machinery and piping systems essential for the dock operation are to be constructed and installed, as far as applicable and practicable, in compliance with the requirements of Part C, Ch 1 of the Rules.

Arrangements to discharge ballast water are to be provided in such a way that at least two pumps may be used to drain each tank which may be flooded.

1.2 **Height of air pipes**

1.2.1 *(1/7/2025)*
The height of air pipes is to be at least at 1000 mm from the waterline corresponding to the maximum immersion of the floating docks

2 Electrical installations

2.1 General

2.1.1 The components of the electrical installation are to be constructed and installed in compliance with the requirements of Part C, Chapter 2 of the Rules.

Parts constructed in compliance with national or international regulations for industrial installations will be specially considered.

In this last case particular attention is to be given to the environmental conditions anticipated for the dock operations, and to the precautions taken for maintenance.

2.1.2 The testing of the electrical installation is to include the following phases:

- inspection and test of components

- check of the arrangement of components

- final test of the installation.

3 Documentation to be submitted

3.1 General

3.1.1 Documents and details relating to machinery and systems required in Part C, Chapters 1 and 2, as far as reasonably applicable, are to be submitted to TASNEEF for approval.