RULES FOR MARINE POLLUTION PREVENTION SYSTEMS

RULES

2006 AMENDMENT NO.2

Rule No.56 3rd October 2006

Resolved by Technical Committee on 6th July 2006

Approved by Board of Directors on 25th July 2006

Rule No.56 3rd October 2006
AMENDMENT TO THE RULES FOR MARINE POLLUTION PREVENTION SYSTEMS

"Rules for marine pollution prevention systems" has been partly amended as follows:

Part 1 GENERAL

Chapter 1 GENERAL

1.1 General

Title of paragraph 1.1.2 has been amended as follows.

1.1.2 Equivalents (*Regulation* 5.1 of *Annex* I, *Regulation* 5.1 and 5.3 of *Annex* II and *Regulation* 4(1) of *Annex* VI)

Main text has been amended as -1.
Sub-paragraph -2 has been newly added as follows.

2 Notwithstanding the provisions in **1.1.2-1**, the construction and equipment of liquefied gas carriers certified to carry Noxious Liquid Substance listed in **Table N19.1 in Part N of Rules for the Survey and Construction of Steel Ships**, shall be deemed to be equivalent to the construction and equipment requirements contained in **2.2.2**, **4.3** and **4.4** of **Part 4**, provided that the gas carrier meets all follows condition:

(1) To be provided with compliance with the requirements of **Part N of Rules for the Survey and Construction of Steel Ships** or the requirements separately provided by Society;

(2) To be provided with compliance with the requirements of **Part 4** except **2.2.2**, **4.3** and **4.4** of **Part 4** for liquefied gas carriers to carry only Noxious Liquid Substance listed in **Table N19.1** of **Part N**;

(3) To be provided with segregated ballast arrangements;

(4) To be provided with pumping and piping arrangements to ensure Capacity of stripping system in **Table 4-3** of **Part 4**;

(5) To be provided with a Manual for procedures and arrangements for discharge of noxious liquid substances, ensuring that no operational mixing of cargo residues and water will occur and that no cargo residues will remain in the tank after applying the ventilation procedures.

Chapter 2 TERMINOLOGY AND ABBREVIATION

2.1 General

The title of 2.1.1 has been amended as follows.

2.1.1 **Terminology** (*Regulation* 1 of *Annex* I and *Regulation* 1 of *Annex* II)

Sub-paragraph (4) has been amended as follows.

(4) "Noxious liquid substance" means any substance asigned as Category *X*, *Y* or *Z* in **Table S17.1** and **Table S18.1 in Part S of Rules for the Survey and Construction of Steel Ships** or provisionally assessed under the provisions of regulations 6.3 of *Annex* II of *MARPOL* 73/78 as falling into Category *X*, *Y* or *Z*.

Sub-paragraph (21) has been amended as follows.

(21) "Equipment for the prevention of discharge of noxious liquid substance" contains prewashing system, stripping system, underwater discharge system, discharge system to a reception facility, ventilated washing system and segregated ballast tanks.

2.1.2 Abbreviations

Sub-paragraph (6) has been deleted.
Sub-paragraphs (7) through (18) have been renumbered to Sub-paragraph (6) through (17).

Part 2 SURVEYS

Chapter 1 GENERAL

1.3 Verification Survey of Certificates, etc

1.3.2 Certificates and Documents other than those specified in 1.3.1

Sub-paragraph (2) has been amended as follows.

(2) Relating to the installations for the prevention of pollution by noxious liquid substances in bulk
  (a) Approved Procedures and Arrangements Manual for the discharge of noxious liquid substances
  (b) Cargo record book
  (c) Shipboard Marine Pollution Emergency Plan for Noxious Liquid Substances

Chapter 2 REGISTRATION SURVEYS

2.1 Registration Surveys during Construction

2.1.2 Submission of Plans and Documents for Approval

Sub-paragraph -1(2)(b) has been amended as follows.

(b) Calculation for the requirements of arrangement of bulkheads in spaces carrying cargo oils

Sub-paragraph -1(3) has been amended as follows.

(3) Installations for the prevention of pollution by noxious liquid substances from ships carrying noxious liquid substances in bulk
  (a) Plans and documents relevant to the pumping system
  (b) Plans and documents relevant to the prewashing system
  (c) Plans and documents relevant to the stripping system
  (d) Plans and documents relevant to the underwater discharge arrangements
  (e) Plans and documents relevant to the discharge arrangements to reception facilities
  (f) Plans and documents relevant to the ventilated washing system
  (g) Procedures and Arrangements Manual for the discharge of noxious liquid substances
  (h) List of cargoes intended to be carried on board
  (i) Other plans and documents as deemed necessary by the Society

2.1.3 Inspections of Construction and Equipment

The titles of sub-paragraphs -1(1), (2), (3) and (4) have been amended as follows.

(1) Equipment to control discharge of oily bilge from machinery spaces (*Regulation* 14 of *Annex* I)
(2) Fuel oil tanks (*Regulation* 16 of *Annex* I)
(3) Tanks for oil residues (*Regulation* 12 of *Annex* I)
(4) Standard discharge connections (*Regulation* 13 of *Annex* I)

The titles of sub-paragraphs -2(1), (2), (3), (4), (5) and (6) have been amended as follows.

(1) Segregated ballast tanks (*Regulation* 18 of *Annex* I)
(2) Crude Oil Washing System (*Regulation* 33 of *Annex* I)
(3) Retention of Oil on Board (*Regulations* 29 and 31 of *Annex* I)
(4) Pumps, piping and discharge arrangements (*Regulation* 30 of *Annex* I)
(5) Arrangements (*Regulation* 26 of *Annex* I)
(6) Subdivision and stability (*Regulations* 27 and 28 of *Annex* I)

Sub-paragraphs -3(4), (6) and (7) have been deleted.
Sub-paragraphs -3(5) and (8) have been renumbered to (4) and (5).

Paragraph 2.1.4 has been added as follows.

2.1.4 Documents to be maintained on board

At the completion of a registration survey, the Surveyor confirms that applicable certificates and documents of those specified in **1.3.2** are on board.

2.2 Registration Surveys not Built under the Survey

Paragraph 2.2.4 has been added as follows.

2.2.4 Documents to be maintained on board

At the completion of a registration survey, the Surveyor confirms that certificates and documents specified in **2.1.4** are on board.

Chapter 3 REGISTRATION MAINTENANCE SURVEYS

3.1 Annual Surveys

3.1.2 Inspections of Construction and Equipment

The titles of sub-paragraphs -1(1), (2), (3) and (4) have been amended as follows.

(1) Equipment to control discharge of oily bilge from machinery spaces (*Regulation* 14 of *Annex* I)
(2) Fuel oil tanks (*Regulation* 16 of *Annex* I)
(3) Tanks for oil residues (*Regulation* 12 of *Annex* I)
(4) Standard discharge connections (*Regulation* 13 of *Annex* I)

The titles of sub-paragraphs -2(1), (2), (3) and (4) have been amended as follows.

(1) Segregated ballast tanks (*Regulation* 18 of *Annex* I)
(2) Crude oil washing system (*Regulation* 33 of *Annex* I)
(3) Retention of oil on board (*Regulations* 29 and 31 of *Annex* I)
(4) Pumps, piping and discharge arrangements (*Regulation* 30 of *Annex* I)

Sub-paragraphs -3(4), (6) and (7) have been deleted.
Sub-paragraphs -3(5) and (8) have been renumbered to (4) and (5).

3.2 Intermediate Surveys

3.2.2 Inspections of Construction and Equipment

The title of sub-paragraph -2(1) has been amended as follows.

(1) Crude oil washing system (*Regulation* 33 of *Annex* I)

Sub-paragraphs -3(4), (6) and (7) have been deleted.
Sub-paragraphs -3(5) and (8) have been renumbered to (4) and (5).

3.3 Special Surveys

3.3.2 Inspections of Construction and Equipment

The titles of sub-paragraphs -2(1), (2), (3) and (4) have been amended as follows.

(1) Segregated ballast tanks (*Regulation* 18 of *Annex* I)
(2) Crude oil washing system (*Regulation* 33 of *Annex* I)

(3) Retention of oil on board (*Regulations* 29 and 31 of *Annex* I)
(4) Pumps, piping and discharge arrangements (*Regulation* 30 of *Annex* I)

Sub-paragraphs -3(4), (6) and (7) have been deleted.
Sub-paragraphs -3(5) and (8) have been renumbered to (4) and (5).

Part 3 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL

Chapter 1 GENERAL

The title of section 1.1 has been amended as follows.

1.1 Application and Terminology

1.1.1 Application

In sub-paragraph -2, the reference regulation numbers of "1.1.3, 2.3.2, 3.2.1(4)(b), 3.3.1-1, 3.3.1-3 through 3.3.1-8, and 3.3.2-1 through 3.3.2-4" have bee replaced with "1.2.1, 2.3.2, 3.2.1(4)(b), 3.3.1-1, 3.3.1-3 through 3.3.1-8, and 3.3.2-1 through 3.3.2-4"

1.1.2 **Terminology** (*Regulation* 1 of *Annex* I)

In sub-paragraph (2), the reference regulation number of "Regulation 10 of Annex I" has been replaced with "Regulation 1.11 of Annex I".

Paragraph 1.1.3 has been deleted.

Section 1.2 has been newly added as follows.

1.2 General Rules

1.2.1 **Restriction on Oil Tanks** (*Regulation* 16 of *Annex* I)

1 For ships of 400 *gross tonnage* and above, no oil tanks are to be provided in a space afore the fore peak tank or the collision bulkhead.

2 For ships of 4,000 *gross tonnage* and above other than oil tankers and oil tankers of 150 *gross tonnage* and above, the fuel oil pipelines including fuel oil tanks are to be segregated from the ballast pipelines. However, ships requiring ballast water in empty fuel oil tanks for the proper maintenance of stability and safety may be exempted from this requirement.

3 Ships other than those stated in the preceding **-1** and **-2** are to satisfy the requirements in the preceding **-1** and **-2** as far as reasonable and practicable.

1.2.2 **Oil Record Book** (*Regulations* 17 and 36 of *Annex* I)

Every oil tanker of 150 *gross tonnage* and above and every ship of 400 *gross tonnage* and above other than an oil tanker are to be provided with an oil record book to record relevant issues including any of the following operations.

(1) Machinery space operations
  (a) Ballasting or cleaning of oil fuel tanks
  (b) Discharging of dirty ballast or cleaning water from oil fuel tanks

(c) Collection and disposal of oil residues (sludge and other oil residues)
(d) Discharge overboard or disposal otherwise of bilge water which has accumulated in machinery spaces
(e) Bunkering of fuel or bulk lubricating oil

(2) Cargo/ballast operations for oil tankers
(a) Loading of oil cargo
(b) Internal oil transfer of oil cargo during voyage
(c) Unloading oil cargo
(d) Ballasting of cargo tanks and dedicated clean ballast tanks
(e) Cleaning of cargo tanks including crude oil washing
(f) Discharge of ballast except from segregated ballast tanks
(g) Discharge of water from slop tanks
(h) Closing of all applicable valves or similar devices after slop tank discharge operations
(i) Closing of valve necessary for isolation of dedicated clean ballast tanks from cargo and stripping lines after slop tank discharge operations
(j) Disposal of residues

Chapter 2 EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL FROM MACHINERY SPACES

The Title of section 2.2 has been amended as follows.

2.2 Storage and Discharge of Oily Residues (Sludge) (Regulations 12 and 13 of Annex I)

2.2.1 Capacity of Sludge Tanks

In the main text of sub-paragraph -1(1)(a), the term "ships not carrying ballast water in fuel oil tanks, whose keel was laid before 30 December 1990, or ships at a similar stage of construction" has been replaced with "ships not carrying ballast water in fuel oil tanks, which were at beginning stage of construction before 31 December 1990"

In the main text of sub-paragraph -1(1)(b), the term "ships not carrying ballast water in fuel oil tanks, whose keel was laid after 31 December 1990, or ships at a similar stage of construction" has been replaced with "ships not carrying ballast water in fuel oil tanks, which were at beginning stage of construction on or after 31 December 1990"

In the main text of sub-paragraph -1(2), the term "ships whose keel was laid before 31 December 1991, or ships at a similar stage of construction" has been replaced with "ships which were at beginning stage of construction until 31 December 1991"

2.2.2 Construction of Sludge Tanks and Piping Arrangements

In the main text of sub-paragraph -2, the term "ships whose keel was laid after 31 December 1990, or in a similar stage of construction" has been replaced with "ships which were at beginning stage of construction on or after 31 December 1990"

In sub-paragraph -2(2)(b), the term "ships whose keel was laid before 31 December 1991, or in a similar stage of construction" has been replaced with "ships which were at beginning stage of construction until 31 December 1991"

The title of section 2.3 has been amended as follows.

2.3 Oily-water Separating Equipment, Oil Filtering System, Oil Discharge Monitoring and Control System for Bilge, and Bilge Water Holding Tanks (*Regulation* 14 of *Annex* I)

2.3.4 Bilge Water Holding Tanks

In the main text of sub-paragraph (1), the term "ships whose keel was laid before 31 December

1991, ships in a similar stage of construction" has been replaced with "ships which were at beginning stage of construction until 31 December 1991".

The title of section 2.4 has been amended as follows.

2.4 Requirements for Installation (*Regulation* 14 of *Annex* I)

2.4.1 General

Sub-paragraph -2 has been amended as follows.

2 For ships other than oil tankers, of less than 100 *gross tonnage*, where any oily mixture is to be discharged into the sea, oil filtering systems specified in **2.3.2-1(1)** are to be provided.

Table 3-2-1 has been renumbered to Table 3-2.

In the remarks of Table 3-2, reference regulation numbers of "2.3.2(1)" and "2.3.2(3)" have been replaced with "2.3.2-1(1)" and "2.3.2-1(3)" respectively.

Table 3-2-2 has been deleted.

2.4.2 Modifications

The main text of sub-paragraph -2 has been amended as follows.

2 Notwithstanding the requirements in the preceding **2.4.1**, for ships listed below where all of the oily bilge is intended to be discharged exclusively to reception facilities, oil filtering system may be substituted with bilge water holding tanks.

Sub-paragraph -2(3) has been deleted, sub-paragraph -2(4) has been renumbered to -2(5) and sub-paragraphs -2(3) and (4) have been added as follows.

(3) Ships subject to the **Rules for High Speed Craft** engaged on a scheduled service with a turn-around time not exceeding 24 *hours* and covering also non-passenger/cargo-carrying relocation voyages for these ships.
(4) Ships, such as hotel ships, storage vessels, etc., which are stationary except for non-cargo-carrying relocation voyages.

Chapter 3 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL CARRIED IN BULK

3.1 General

3.1.1 Application

In sub-paragraphs -2(2) and -3(2), the terms “the keels of which are laid or which are at a similar stage of construction” have been replaced with “which are at beginning stage of construction”

Sub-paragraphs -4 and -5 have been added as follows.

4 The requirements of **3.2.5** are to apply to oil tankers of 5,000 *tonnes* deadweight and above, which are at beginning stage of construction on or after 1 January 2007.

5 The requirements of **3.2.1-1** and **3.3.2-5** are to apply to oil tankers:

(1) for which the building contract is placed on or after 1 January 2007, or

(2) in the absence of a building contract, which are at beginning stage of construction on or after 1 July 2007, or

(3) the delivery of which is on or after 1 January 2010, or

(4) which have undergone a major conversion:

(a) for which the contract is placed on or after 1 January 2007,

(b) in the absence of a contract, the construction work of which is begun on or after 1 July 2007, or

(c) which is completed on or after 1 January 2010.

3.2 Hull Construction

The title of paragraph 3.2.1 has been amended as follows.

3.2.1 Arrangement of Bulkheads in Spaces Carrying Cargo Oil (*Regulations* 23, 24, 25 and 26 of *Annex* I)

The existing text has been numbered to sub-paragraph -2, and then sub-paragraph -1 has been added as follows.

1 To provide adequate protection against oil pollution in the event of collision or stranding the following is to be complied with the followings.

(1) For oil tankers of 5,000 *tonnes* deadweight (*DWT*) and above, the mean oil outflow parameter (O_M) is to be as follows:

$O_M \le 0.015$ for $C \le 200{,}000$ (m^3)

$O_M \le 0.012 + \frac{0.003}{200{,}000}(400{,}000 - C)$ for $200{,}000 < C < 400{,}000$ (m^3)

$O_M \le 0.012$ for $C \ge 400{,}000$ (m^3)

O_M : Mean oil outflow parameter

C : Total volume of cargo oil, in m^3, at 98% tank filling

(2) Notwithstanding the above **(1)**, for combination carriers between 5,000 *tonnes* deadweight (*DWT*) and 200,000 m^3 capacity, the mean oil outflow parameter may be applied, provided calculations are submitted to the satisfaction of the Society, demonstrating that after accounting for its increased structural strength, the combination carrier has at least equivalent oil out flow performance to a standard double hull tanker of the same size having a $O_M \leq 0.015$.

$O_M \leq 0.021$ for $C \leq 100{,}000$ (m^3)

$O_M \leq 0.015 + \frac{0.006}{100{,}000}(200{,}000 - C)$ for $100{,}000 < C < 200{,}000$ (m^3)

(3) For oil tankers of less than 5,000 *tonnes* deadweight (*DWT*), the length of each cargo tank is not to exceed 10 *m* or one of the following values, whichever is the greater:

(a) where no longitudinal bulkhead is provided inside the cargo tanks:

$\left(0.5\frac{b_i}{B} + 0.1\right)L_f$, but not to exceed $0.2L_f$

(b) where a centreline longitudinal bulkhead is provided inside the cargo tanks:

$\left(0.25\frac{b_i}{B} + 0.15\right)L_f$

(c) where two or more longitudinal bulkheads are provided inside the cargo tanks:

i) for wing cargo tanks: $0.2L_f$

ii) for centre cargo tanks:

1) if $\frac{b_i}{B} \geq 0.2$: $0.2L_f$

2) if $\frac{b_i}{B} < 0.2$:

- where no centreline longitudinal bulkhead is provided:

$\left(0.5\frac{b_i}{B} + 0.1\right)L_f$

- where a centreline longitudinal bulkhead is provided:

$\left(0.25\frac{b_i}{B} + 0.15\right)L_f$

"b_i" is the minimum distance, in *m*, from the ship's side to the outer longitudinal bulkhead of the tank in question measured inboard at right angles to the centreline at the level corresponding to the assigned summer freeboard.

(4) The following general assumptions are to apply when calculating the mean oil outflow parameter specified in **(1)** and **(2)** above.

(a) The cargo block length extends between the forward and aft extremities of all tanks arranged for the carriage of cargo oil, including slop tanks.

(b) Where this regulation refers to cargo tanks, it is to be understood to include all cargo tanks, slop tanks and fuel tanks located within the cargo block length.

(c) The ship is to be assumed loaded to the load line draught d_S without trim or heel. "d_S" is the vertical distance, in *m*, from the moulded baseline at mid-length to the waterline corresponding to the summer freeboard to be assigned to the ship. Calculations pertaining to this regulation are to be based on draught d_S,

notwithstanding assigned draughts that may exceed d_S, such as the tropical loadline.

(d) All cargo oil tanks are to be assumed loaded to 98% of their volumetric capacity. The nominal density of the cargo oil (ρ_n) is to be calculated as follows:

$$\rho_n = 1000\frac{DWT}{C} \quad (kg/m^3)$$

DWT : Deadweight (*tonnes*)

(e) For the purposes of these outflow calculations, the permeability of each space within the cargo block, including cargo tanks, ballast tanks and other non-oil spaces is to be taken as 0.99, unless proven otherwise.

(f) Suction wells may be neglected in the determination of tank location provided that such wells are as small as practicable and the distance between the well bottom and bottom shell plating is not less than 0.5*h*, where *h* is the height as defined in **3.2.4(1)(a)ii)**.

(5) The following assumptions are to be used when combining the oil outflow parameters.

(a) The mean oil outflow is to be calculated independently for side damage and bottom damage and then combined into the non-dimensional oil outflow parameter O_M, as follows:

$$O_M = \left(0.4 \cdot O_{MS} + 0.6 \cdot O_{MB}\right)/C$$

O_{MS} : Mean outflow for side damage (m^3)

O_{MB} : Mean outflow for bottom damage (m^3)

(b) For bottom damage, independent calculations for mean outflow are to be for 0 *m* and minus 2.5 *m* tide conditions, and then combined as follows:

$$O_{MB} = 0.7 \cdot O_{MB(0)} + 0.3 \cdot O_{MB(2.5)}$$

$O_{MB(0)}$: Mean outflow for 0 *m* tide condition (m^3)

$O_{MB(2.5)}$: Mean outflow for minus 2.5 *m* tide condition (m^3)

(6) The mean outflow for side damage O_{MS} is to be calculated as follows:

$$O_{MS} = C_3 \sum_i^n P_{S(i)} \cdot O_{S(i)} \quad (m^3)$$

i : Represents each cargo tank under consideration

n : Total number of cargo tanks

$P_{S(i)}$: The probability of penetrating cargo tank i from side damage, calculated in accordance with **(8)**

$O_{S(i)}$: The outflow, in m^3, from side damage to cargo tank i, which is assumed equal to the total volume in cargo tank i at 98% filling, unless it is proven by methods deemed appropriate by the Society that any significant cargo volume will be retained

C_3 : C_3 equals 0.77 for ships having two longitudinal bulkheads inside the cargo tanks, provided these bulkheads are continuous over the cargo block and $P_{S(i)}$ is developed in accordance with this regulation. C_3 equals 1.0 for all other ships or when $P_{S(i)}$ is developed in accordance with **(10)**.

(7) The mean outflow for bottom damage is to be calculated for each tidal condition as follows:

(a) $O_{MB(0)} = \sum_{i}^{n} P_{B(i)} \cdot O_{B(i)} \cdot C_{DB(i)}$ (m^3)

i : Represents each cargo tank under consideration

n : Total number of cargo tanks

$P_{B(i)}$: The probability of penetrating cargo tank i from bottom damage, calculated in accordance with **(9)**

$O_{B(i)}$: The outflow, in m^3, from side damage to cargo tank i, calculated in accordance with **(c)** and **(d)**

$C_{DB(i)}$: Factor to account for oil capture as defined in **(e)**

(b) $O_{MB(2.5)} = \sum_{i}^{n} P_{B(i)} \cdot O_{B(i)} \cdot C_{DB(i)}$ (m^3)

i, n, $P_{B(i)}$ and $C_{DB(i)}$: As defined in **(a)**

$O_{B(i)}$: The outflow from cargo tank i, in m^3, after tidal change

(c) The oil outflow $O_{B(i)}$ for each cargo oil tank is to be calculated based on pressure balance principles, in accordance with the following assumptions:

i) The ship is to be assumed stranded with zero trim and heel, with the stranded draught prior to tidal change equal to the load line draught d_S.

ii) The cargo level after damage is to be calculated as follows:

$h_C = \{(d_S + t_C - Z_l)\rho_S - (1000p)/g\}/\rho_n$

h_C : The height of the cargo oil above Z_l (m)

t_C : The tidal change, in *m*. Reductions in tide are to be expressed as negative values.

Z_l : The height of the lowest point in the cargo tank above baseline (*m*)

ρ_S : Density of seawater, to be taken as 1.025 kg/m^3

p : If an inert gas system is fitted, the normal overpressure, in *kPa*, to be taken as not less than 5 *kPa*; if an inert gas system is not fitted, the overpressure may be taken as 0.

g : The acceleration of gravity, to be taken as 9.81 m/s^2

ρ_n : Nominal density of cargo oil, calculated in accordance with **(4)(d)**

(d) For cargo tanks bounded by the bottom shell, unless proven otherwise, oil outflow $O_{B(i)}$ is to be taken not less than 1% of the total volume of cargo oil loaded in cargo tank i, to account for initial exchange losses and dynamic effects due to current and waves.

(e) In the case of bottom damage, a portion from the outflow from a cargo tank may be captured by non-oil compartments. This effect is approximated by application of the factor $C_{DB(i)}$ for each tank, which is to be taken as follows:

$C_{DB(i)} = 0.6$ for cargo tanks bounded from below by non-oil compartments;

$C_{DB(i)} = 1.0$ for cargo tanks bounded by the bottom shell.

(8) The probability P_S of breaching a compartment from side damage is to be calculated as follows:

$P_S = P_{SL} \cdot P_{SV} \cdot P_{ST}$

$P_{SL} = 1 - P_{Sf} - P_{Sa}$: Probability the damage will extend into the longitudinal zone bounded by X_a and X_f

$P_{SV} = 1 - P_{Su} - P_{Sl}$: Probability the damage will extend into the vertical zone bounded by Z_l and Z_u

$P_{ST} = 1 - P_{Sy}$: Probability the damage will extend transversely beyond the boundary defined by y

P_{Sa}, P_{Sf}, P_{Sl} and P_{Su} : Probabilities defined as the follows, are to be determined by linear interpolation from the table of probabilities for side damage provided in **Table 3-3**.

P_{Sa} : The probability the damage will lie entirely aft of location X_a / L_f

P_{Sf} : The probability the damage will lie entirely forward of location X_f / L_f

P_{Sl} : The probability the damage will lie entirely below the tank

P_{Su} : The probability the damage will lie entirely above the tank

P_{Sy} : The probability the damage will lie entirely outboard of the tank. P_{Sy} is to be calculated as follows. However, P_{Sy} is not to be taken greater than 1.

$P_{Sy} = (24.96 - 199.6\, y/B_S)(y/B_S)$ for $y/B_S \le 0.05$

$P_{Sy} = 0.749 + \{5 - 44.4(y/B_S - 0.05)\}(y/B_S - 0.05)$ for $0.05 < y/B_S < 0.1$

$P_{Sy} = 0.888 + 0.56(y/B_S - 0.1)$ for $y/B_S \ge 0.1$

B_S : The greatest moulded breadth of the ship, in *m*, at or below the deepest load line d_S.

X_a : The longitudinal distance from the aft terminal of L_f to the aftmost point on the compartment being considered (*m*)

X_f : The longitudinal distance from the aft terminal of L_f to the foremost point on the compartment being considered (*m*)

Z_l : The vertical distance from the moulded baseline to the lowest point on the compartment being considered (*m*)

Z_u : The vertical distance from the moulded baseline to the highest point on the compartment being considered (*m*). Z_u is not to be taken greater than D_S.

y : The minimum horizontal distance measured at right angles to the centreline between the compartment under consideration and the side shell (*m*)

(9) The probability P_B of breaching a compartment from bottom damage is to be calculated as follows:

$P_B = P_{BL} \cdot P_{BT} \cdot P_{BV}$

$P_{BL} = 1 - P_{Bf} - P_{Ba}$: Probability the damage will extend into the longitudinal zone bounded by X_a and X_f

$P_{BT} = 1 - P_{Bp} - P_{Bs}$: Probability the damage will extend into the transverse zone bounded by Y_p and Y_s

$P_{BV} = 1 - P_{Bz}$: Probability the damage will extend vertically beyond the boundary defined by z

P_{Ba}, P_{Bf}, P_{Bp} and P_{Bs} : Probabilities defined as the follows, are to be determined by linear interpolation from the table of probabilities for side damage provided in **Table 3-4**.

P_{Ba} : The probability the damage will lie entirely aft of location X_a/L_f

P_{Bf} : The probability the damage will lie entirely forward of location X_f/L_f

P_{Bp} : The probability the damage will lie entirely to port of the tank

P_{Bs} : The probability the damage will lie entirely to starboard of the tank

P_{Bz} : The probability the damage will lie entirely below the tank. P_{Bz} is to be calculated as follows. However, P_{Bz} is not to be taken greater than 1.

$P_{Bz} = (14.5 - 67\, z/D_S)(z/D_S)$ for $z/D_S \le 0.1$

$P_{Bz} = 0.78 + 1.1(z/D_S - 0.1)$ for $z/D_S > 0.1$

D_S : The moulded depth, in *m*, measured at mid-length to the upper deck at side

X_a and X_f : As defined in **(8)**

Y_p : The transverse distance from the port-most point on the compartment located at or below the waterline d_B, to a vertical plane located $B_B/2$ to starboard of the ship's centerline (*m*). "B_B" is the greatest moulded breadth of the ship, in *m*, at or below the waterline d_B. "d_B" is the vertical distance, in *m*, from the moulded baseline at mid-length to the waterline corresponding to 30% of the depth D_S.

Y_s : The transverse distance from the starboard-most point on the compartment located at or below the waterline d_B, to a vertical plane located $B_B/2$ to starboard of the ship's centerline (*m*)

z : The minimum value of z over the length of the compartment, where, at any given longitudinal location, z is the vertical distance from the lower point of the bottom shell at that longitudinal location to the lower point of the compartment at that longitudinal location (*m*).

(10) The calculation specified in the provisions of **(4)** to **(9)** above uses a simplified probabilistic approach where a summation is carried out over the contributions to the mean outflow from each cargo tank. For certain designs such as those characterized by the occurrence of steps/recesses in bulkheads/decks and for sloping bulkheads and/or a pronounced hull curvature, where deemed appropriate by the Society, more rigorous calculations may be appropriate.

(11) The following provisions regarding piping arrangements are to apply.

(a) Lines of piping that run through cargo tanks in a position less than $0.30B_S$ from the ship's side or less than $0.30D_S$ from the ship's bottom are to be fitted with valves or similar closing devices at the point at which they open into any cargo tank. These valves are to be kept closed at sea at any time when the tanks contain cargo oil, except that they may be opened only for cargo transfer needed for essential cargo operations.

(b) Credit for reducing oil outflow through the use of an emergency rapid cargo transfer system or other system arranged to mitigate oil outflow in the event of an accident may be taken into account where deemed appropriate by the Society.

The main text of sub-paragraph -2 has been amended as follows.

2 For spaces carrying oil cargoes of oil tankers not subject to the requirements of **-1** above, oil-tight bulkheads are to be arranged so that hypothetical oil outflow and the restricted size of individual cargo oil tanks might not be exceeded due to damage defined as below.

In sub-paragraph -2(1), reference tables of "Table 3-3 and Table 3-4" have been replaced with "Table 3-5 and Table 3-6".

Tables 3-3 to 3-8 have been renumbered to Tables 3-5 to 3-10 respectively, and Tables 3-3 and 3-4 have been added as follows.

Table 3-3 Probabilities for Side Damage

X_a/L_f	P_{Sa}	X_f/L_f	P_{Sf}	Z_l/D_S	P_{Sl}	Z_u/D_S	P_{Su}
0.00	0.000	0.00	0.967	0.00	0.000	0.00	0.968
0.05	0.023	0.05	0.917	0.05	0.000	0.05	0.952
0.10	0.068	0.10	0.867	0.10	0.001	0.10	0.931
0.15	0.117	0.15	0.817	0.15	0.003	0.15	0.905
0.20	0.167	0.20	0.767	0.20	0.007	0.20	0.873
0.25	0.217	0.25	0.717	0.25	0.013	0.25	0.836
0.30	0.267	0.30	0.667	0.30	0.021	0.30	0.789
0.35	0.317	0.35	0.617	0.35	0.034	0.35	0.733
0.40	0.367	0.40	0.567	0.40	0.055	0.40	0.670
0.45	0.417	0.45	0.517	0.45	0.085	0.45	0.599
0.50	0.467	0.50	0.467	0.50	0.123	0.50	0.525
0.55	0.517	0.55	0.417	0.55	0.172	0.55	0.452
0.60	0.567	0.60	0.367	0.60	0.226	0.60	0.383
0.65	0.617	0.65	0.317	0.65	0.285	0.65	0.317
0.70	0.667	0.70	0.267	0.70	0.347	0.70	0.255
0.75	0.717	0.75	0.217	0.75	0.413	0.75	0.197
0.80	0.767	0.80	0.167	0.80	0.482	0.80	0.143
0.85	0.817	0.85	0.117	0.85	0.553	0.85	0.092
0.90	0.867	0.90	0.068	0.90	0.626	0.90	0.046
0.95	0.917	0.95	0.023	0.95	0.700	0.95	0.013
1.00	0.967	1.00	0.000	1.00	0.775	1.00	0.000

Table 3-4 Probabilities for Bottom Damage

X_a/L_f	P_{Ba}	X_f/L_f	P_{Bf}	Y_p/B_B	P_{Bp}	Y_s/B_B	P_{Bs}
0.00	0.000	0.00	0.969	0.00	0.844	0.00	0.000
0.05	0.002	0.05	0.953	0.05	0.794	0.05	0.009
0.10	0.008	0.10	0.936	0.10	0.744	0.10	0.032
0.15	0.017	0.15	0.916	0.15	0.694	0.15	0.063
0.20	0.029	0.20	0.894	0.20	0.644	0.20	0.097
0.25	0.042	0.25	0.870	0.25	0.594	0.25	0.133
0.30	0.058	0.30	0.842	0.30	0.544	0.30	0.171
0.35	0.076	0.35	0.810	0.35	0.494	0.35	0.211
0.40	0.096	0.40	0.775	0.40	0.444	0.40	0.253
0.45	0.119	0.45	0.734	0.45	0.394	0.45	0.297
0.50	0.143	0.50	0.687	0.50	0.344	0.50	0.344
0.55	0.171	0.55	0.630	0.55	0.297	0.55	0.394
0.60	0.203	0.60	0.563	0.60	0.253	0.60	0.444
0.65	0.242	0.65	0.489	0.65	0.211	0.65	0.494
0.70	0.289	0.70	0.413	0.70	0.171	0.70	0.544
0.75	0.344	0.75	0.333	0.75	0.133	0.75	0.594
0.80	0.409	0.80	0.252	0.80	0.097	0.80	0.644
0.85	0.482	0.85	0.170	0.85	0.063	0.85	0.694
0.90	0.565	0.90	0.089	0.90	0.032	0.90	0.744
0.95	0.658	0.95	0.026	0.95	0.009	0.95	0.794
1.00	0.761	1.00	0.000	1.00	0.000	1.00	0.844

Tables 3-9 and 3-10 have been renumbered to Tables 3-10 and 3-9 respectively.

The title of paragraph 3.2.2 has been amended as follows.

3.2.2 Subdivision and Stability (Regulations 27 and 28 of Annex I)

In sub-paragraph -2(1), reference table of "Table 3-5" has been replaced with "Table 3-7".

Sub-paragraph -2(2) has been amended as follows.

(2) The extent of bottom damage is to be as shown in **Table 3-8**. However, for oil tankers of 20,000 *tons* deadweight and above, the damage assumptions specified in **Table 3-8** are to be supplemented by the assumed bottom raking damage in accordance with **Table 3-9**.

In sub-paragraph -4(2), reference table of "Table 3-7" has been replaced with "Table 3-10".

The title of paragraphs 3.2.3 and 3.2.4 have been amended as follows.

3.2.3 Segregated Ballast Tanks (*Regulation* 18 of *Annex* I)

3.2.4 Prevention of Oil Pollution in the Event of Collision or Stranding (*Regulation* 19 of *Annex* I)

The main text of sub-paragraph (1)(a) has been amended as follows.

(a) The entire cargo tank length is to be protected by ballast tanks or spaces other than tanks that carry oil as follows:

Sub-paragraph (2) has been deleted and sub-paragraphs (3) and (4) have been renumbered to (2) and (3) respectively.

In sub-paragraph (3), the term "whose keel was laid or was at a similar stage of construction" has been replaced with "which were at beginning stage of construction".

Paragraph 3.2.5 has been newly added as follows.

3.2.5 Cargo Pump-Room Protection (*Regulation* 22 of *Annex* I)

1 The cargo pump-room of oil tankers of 5,000 *tonnes* deadweight and above is to be provided with a double bottom such that at any cross-section the depth of each double bottom tank or space shall be such that the distance *h* between the bottom of the pump-room and the ship's base line measured at right angles to the ship's base line is not to be less than specified below:

$h = B/15(m)$ or

$h = 2\ m$, whichever is the lesser.

However, the minimum value of $h = 1.0\ m$.

2 In case of cargo pump rooms whose bottom plate is located above the base line by at least the minimum height required in **-1** above (*e.g.* gondola stern designs), there will be no need for a double bottom construction in way of the pump-room.

3 Ballast pumps, where provided within cargo pump-room, are to be provided with suitable arrangements to ensure efficient suction from double bottom tanks.

4 Notwithstanding the provisions of **-1** and **-2** above, where the flooding of the cargo pump-room would not render the ballast or cargo pumping system inoperative, a double bottom need not be fitted.

3.3 Installations and Piping Arrangements

The titles of paragraphs 3.3.1 and 3.3.2 have been amended as follows.

3.3.1 Installations for the Retention of Oil on Board (*Regulations* 29, 31 and 32 of *Annex* I)

3.3.2 Discharge Arrangements (*Regulation* 30 of *Annex* I)

Sub-paragraph -2(1) has been amended as follows.

(1) The pipelines for the discharge of segregated ballast and clean ballast where means are provided for inspecting the surface of the ballast water immediately before discharging, and discharge is made within in-port areas or offshore mooring systems, discharged at sea only by gravity or discharged at sea by pumps if the ballast water exchange is performed under methods deemed as appropriate by the Society.

Sub-paragraph -5 has been added as follows.

5 Every oil tankers of 150 *gross tonnage* and above which has installed a sea chest that is permanently connected to the cargo pipeline system, are to be equipped with both a sea chest valve and an inboard isolation valve. In addition to these valves, the sea chest is to be capable of isolation from the cargo piping system whilst the tanker is loading, transporting, or discharging cargo by use of an appropriate positive means. Such a positive means is to be a facility that is installed in the pipeline system in order to prevent, under all circumstances, the section of pipeline between the sea chest valve and the inboard valve being filled with cargo.

3.4 Crude Oil Washing System

The title of paragraph 3.4.1 has been amended as follows.

3.4.1 Requirements for Installation (*Regulations* 33 and 35 of *Annex* I)

The existing paragraph has been numbered to sub-paragraph -1, and sub-paragraph -2 has been added as follows.

2 Oil tankers other than those specified in **-1**, provided with crude oil washing systems are to comply with the requirements of **3.4**, except **3.4.3(2)**, **3.4.4(2)** to **(5)**, and **3.4.5(2)**, **(4)**, **(6)** and **(7)**.

Chapter 4 TRANSITIONAL REQUIREMENTS

Tables 3-9 and 3-11 have been renumbered to Tables 3-11 and 3-12 respectively.

4.1 General

4.1.1 Application

In sub-paragraph -1, the term "whose keel was laid" has been replaced "which were at beginning stage of construction".

In sub-paragraph -2, reference table "Table 3-9" has been replaced with "Table 3-11".

In Table 3-11, reference regulation numbers of "1.1.3-1", "1.1.3-2", "1.1.3-3" and "3.2.1" have been replaced with "1.2.1-1", "1.2.1-2", "1.2.1-3" and "3.2.1-2" respectively.

In Table 3-11, column relating to regulation 2.2.1-2 have been deleted.

The title of paragraph 4.1.2 has been amended as follows.

4.1.2 Definitions (*Regulations* 1, 20 and 21 of *Annex* I)

Sub-paragraph (8)(b) has been amended as follows.

(b) Oils, other than crude oils, having either a density at 15℃ higher than 900 kg/m^3 or a kinematic viscosity at 50℃ higher than 180 mm^2/s

4.2 General Requirements

The title of paragraph 4.2.1 has been amended as follows.

4.2.1 Arrangements of Forepeak (*Regulation* 16.3 of *Annex* I)

In the main text, the terms of "1.1.3-1" and "the keel of which is laid" have been replaced with "1.2.1-1" and "which were at beginning stage of construction" respectively.

The titles of paragraphs 4.2.2 and 4.2.3 have been amended as follows.

4.2.2 Storage and Discharge of Oil Residues (Sludge) (*Regulation* 12.2 of *Annex* I)

4.2.3 Oil Discharge Monitoring and Control System and Oily-water Separating for Bilge (*Regulation* 14.7 of *Annex* I)

4.3 Equipment for the Prevention of Pollution by Oil Carried in Bulk by Oil Tankers

The title of paragraph 4.3.1 has been amended as follows.

4.3.1 Arrangements of Bulkheads in Spaces Carrying Cargo Oil (*Regulation* 26.1 of *Annex* I)

In the main text, reference regulation number of "3.2.1" has been replaced with "3.2.1-2".

In sub-paragraph (2)(b), the term of "the keel of which is laid" has been replaced with "which were at beginning stage of construction".

The titles of paragraph 4.3.2 and 4.3.3 have been amended as follows.

4.3.2 Subdivision and Stability (*Regulation* 28.3 of *Annex* I)

4.3.3 Segregated Ballast Tanks (*Regulation* 18 of *Annex* I)

In sub-paragraph -1, the term "4.3.3-2 and 4.3.3-3" has been replaced with "4.3.3-2".

Sub-paragraph -3 has been deleted and sub-paragraph -4 has been renumbered to -3.

The title of paragraph 4.3.4 has been amended as follows.

4.3.4 Requirements for Oil Tankers Provided with Clean Ballast Tanks (*Regulation* 18.1 of *Annex* I)

In sub-paragraph -1, the term "4.3.3-3 or 4.3.3-4" has been replaced with "4.3.3-3".

In sub-paragraphs -3 and -4, the terms "oil tankers" have been replaced with "product carriers".

The titles of paragraphs 4.3.5 to 4.3.10 have been amended as follows.

4.3.5 Oil Tankers Engaged in Specific Trades (*Regulation* 2.5 of *Annex* I)

4.3.6 Oil Tankers Carrying Special Ballast (*Regulation* 18.10 of *Annex* I)

4.3.7 Arrangements for the Retention of Oil on Board (*Regulation* 31.1 of *Annex* I)

4.3.8 Discharge Arrangements (*Regulation* 30.6 of *Annex* I)

4.3.9 Cargo Oil piping Arrangements (*Regulation* 30.5 of *Annex* I)

4.3.10 Prevention of Accidental Oil Pollution (*Regulation* 20 of *Annex* I)

In sub-paragraphs -2 and -3, reference tables of "Table 3-11" have been replaced with "Table 3-12".

The title of paragraph 4.3.11 has been amended as follows.

4.3.11 Prevention of Oil Pollution from Oil Tankers Carrying Heavy Grade Oil as Cargo (*Regulation* 21 of *Annex* I)

Part 4 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY DISCHARGES OF NOXIOUS LIQUID SUBSTANCES IN BULK

Chapter 1 GENERAL

1.1 General

1.1.1 Application

The requirements of this chapter apply to construction and equipment for the prevention of pollution by noxious liquid substances in bulk. However, the application of requirements of this Part may be deferred or modified where deemed appropriate by the Society taking into account each noxious liquid substance, subject to the approval by the Administration.

1.2 Definitions

Title of paragraph 1.2.1 has been amended as follows.

1.2.1 Terminology (*Regulation* 1 of *Annex* II)

Sub-paragraphs (1) through (4) have been deleted.
Sub-paragraph (5) has been renumbered to (1).

Sub-paragraph (1) has been amended as follows.

(1) "Clean ballast" means the ballast loaded in a tank which, since it was last used to carry a noxious liquid substance, has been treated in accordance with the one of the requirements of the following **(a)** through **(d)** depending upon the kind of noxious liquid substances and has been emptied.
   (a) Where a substance in Category *X* is carried : to prewash or wash with cargo content confirmed and discharge the tank washings to shore reception facilities; to carry out additional washing and discharge the residue/water mixture resulting therefrom.
   (b) Where a high viscosity or solidifying substance in Category *Y* is carried; to prewash and discharge the tank washings to shore reception facilities; to carry out additional washing and discharge the residue/water mixture resulting therefrom.
   (c) Where a low viscosity or non-solidifying substance in Category *Y* or *Z* is carried: prewash after confirming that the amount of residues resulting from stripping becomes the specified value or less, and to discharge the residue/water mixture resulting therefrom.
   (d) Remove the residues by ventilated washing.

Sub-paragraph (6) has been deleted.
Sub-paragraphs (7) and (8) have been renumbered to (2) and (3).

Sub-paragraph (9) has been deleted.
Sub-paragraphs (10) through (17) have been renumbered to (4) through (11).

Sub-paragraph (7) has been amended as follows.

(7) "High viscosity substance" means a noxious liquid substance in Category *X* or *Y* with a viscosity equal to or greater than 50*mPa.s* at the unloading temperature.

Sub-paragraph (9) has been amended as follows.

(9) "Category *X* noxious liquid substances" (hereinafter referred to as "Category *X* substances" in this Part) are substances, which are bioaccumulated and liable to produce a hazard to aquatic life or human health, listed in **Table S17.1 in Part S of the Rules for the Survey and Construction of Steel Ships** with an entry "*X*" in column 'c' of those tables or those provisionally assessed under the provisions of regulation 6.3 of *Annex* II of *MARPOL* 73/78 as Category *X* substances.

Sub-paragraph (10) has been amended as follows.

(10) "Category *Y* noxious liquid substances" (hereinafter referred to as "Category *Y* substances" in this Part) are substances, which are bioaccumulated with a short retention of the order of one week or less, listed in **Table S17.1 in Part S of the Rules for the Survey and Construction of Steel Ships** with an entry "*Y*" in column 'c' those tables or those provisionally assessed under the provisions of regulation 6.3 of *Annex* II of *MARPOL* 73/78 as Category *Y* substances.

Sub-paragraph (11) has been amended as follows.

(11) "Category *Z* noxious liquid substances" (hereinafter referred to as "Category *Z* substance" in this Part) are substances, which are slightly toxic to aquatic life, listed in **Table S17.1** and **Table S18.1 in Part S of the Rules for the Survey and Construction of Steel Ships** with an entry "*Z*" in column 'c' of those tables or those provisionally assessed under the provisions of regulation 6.3 of *Annex* II of *MARPOL* 73/78 as Category *Z* substances.

Sub-paragraphs (18) and (19) have been deleted.

Sub-paragraph (12) has been newly added as follows.

(12) "Depth of water" means the charted depth.

Sub-paragraph (13) has been newly added as follows.

(13) "Vegetable oils" are substances listed in **Table S17.1 in Part S of the Rules for the Survey and Construction of Steel Ships** with superscript "(k)" in column 'e' of those tables.

Chapter 2 has been amended as follows.

Chapter 2 CONSTRUCTION AND EQUIPMENT

2.1 General

2.1.1 Application

The requirements of this chapter apply to noxious liquid substances in bulk.

2.2 Requirements for Installation of Construction and Equipment

2.2.1 Equipment for the Prevention of Discharge of Noxious Liquid Substances

1 For noxious liquid substances in bulk, equipment for the prevention of discharge of noxious liquid substances specified in **Table 4-1** are to be provided according to the Category and physical properties of the noxious liquid substance to be carried, and sea areas for discharge.

2 For ships intending to remove residues of a noxious liquid substance with a vapour pressure exceeding 5*kPa* at 20℃ by ventilation, ventilated tank washing system is to be provided in addition to the equipment specified in the preceding **2.2.1-1**.

Table 4-1 Equipment for the Prevention of Discharge of Noxious Liquid Substance

Classification of substances		Category *X*	Category *Y*		Category *Z*
Equipment	Sea area of discharge	Outside of Antarctic Area			
	Physical properties	All substances	High viscosity or solidifying property	Low viscosity or non-solidifying property	All substances
Prewash system		○	○	-(1)	-(1)
Striping system		○	○	○	○
Discharge outlet below the waterline		○(2)	○(2)	○(2)	○(2)
Arrangements for discharge to reception facilities		○	○	○(3)	○(3)

Remark

○: to be provided

—: not required to be provided

Notes

(1) If the unloading of a substance is not carried out in accordance with the Manual for procedures and arrangements for discharge of noxious liquid substance, a prewash shall be carried out.

(2) Any ship which discharges only clean ballast may be exempted from this requirement.

(3) Any ship which does not discharge unnecessary noxious liquid substances generated on board may be exempted.

3 Notwithstanding the requirements of **2.2.1-1** and **2.2.1-2**, the equipment for the prevention of

discharge of noxious liquid substances required to be installed in ships complying with the requirements of the following **(1)** and **(2)** are segregated ballast tank and arrangements for discharge to reception facilities.

(1) where it is intended to repeatedly carry in each tank only one of noxious liquid substances or compatible substance (this means one of noxious liquid substances requiring no tank cleaning for locading another substance which differs from the substance in question after its unloading).

(2) where it is intended to discharge the washings generated by the tank cleaning carried out only before repairs or drydocking of the ship to suitable reception facilities.

4 Notwithstanding the requirements in the preceding **2.2.1-1** to **2.2.1-3** above, the equipment for preventing discharge of noxious liquid substances to be provided in ships carrying noxious liquid substances of which vapour pressure exceeds 5*kPa* at 20℃ intending to remove the residues by ventilation are to be the ventilated washing system.

5 Ships are to be provided with the Manual for procedures and arrangements for discharge of noxious liquid substance, approved by the Society.

6 Ships are to be provided with the Cargo record book, recorded loading of cargo, internal transfer of cargo, unloading of cargo, cleaning and prewash of cargo tank, discharge into the sea of tank washings, ballasting of cargo tanks and discharge of ballast water from cargo tanks, etc.

2.2.2 Requirements for Ships Carrying Category *X* Substances, Category *Y* Substances or Category *Z* Substances (*Regulation* 11 of *Annex* II)

Ships carrying Category *X* substances, Category *Y* substances or Category *Z* substances, at beginning stage of construction after 1 July 1986, are to comply with the requirements in **Part S of the Rules for the Survey and Construction of Steel Ships**. Ships carrying Category *X* substances, Category *Y* substances or Category *Z* substances, at beginning stage of construction before 1 July 1986, are to comply with the requirements of the Bulk Chemical Code applicable to ships specified in the requirements of the Code shown in **Table 4-2** according to the mode of service and date of construction.

Table 4-2 Requirements for Existing Ships Carrying Category *X* Substances, Category *Y* Substances or Category *Z* Substances

Mode of navigation	Date of keel laying or placing building contract	No. of applicable Bulk Chemical Code
Ships engage in international voyages	Ships whose building contract in placed before 2 November 1973	1.7.3
	Ships whose building contract in placed on and after 2 November 1973 and ships at beginning stage of construction before 1 July 1983	1.7.2
Ships other than the above	Ships at beginning stage of construction before 1 July 1983	1.7.3
	Ships at beginning stage of construction on and after 1 July 1983 before 1 July 1986	1.7.2

2.2.3 Requirements for Ships Carrying Vegetable Oils (*Regulation* 4 of *Annex* II)

Notwithstanding the provisions in **2.2.2**, an Administration may exempt ships from the carriage requirements under **Part S of the Rules for the Survey and Construction of Steel Ships** or **Bulk Chemical Code** for ships certified to carry individually identified vegetable oils in **Table S17.1 in Part S of the Rules for the Survey and Construction of Steel Ships**, provided the ships complies with the following conditions:

(1) Ships shall meet all requirements for ship type 3 as identified in **2.1.2-1(3) in Part S of the Rules for the Survey and Construction of Steel Ships** except for cargo tank location.

(2) Under this regulation, cargo tanks shall be located at the following distances inboard. The entire cargo tank length shall be protected by ballast tanks or spaces other than tanks that carry oils as follows:

(a) Wing tanks or spaces shall be arranged such that cargo tanks are located inboard of the moulded line of the side shell plating nowhere less than 760 *mm*.

(b) Double bottom tanks or spaces shall be arranged such that the distance between the bottom of the cargo tanks and the moulded line of the bottom shell plating is not less than B/15 (*m*) or 2.0 *m* at the centerline, whichever is the lesser. The minimum distance shall be 1.0 *m*.

Chapter 3 has been amended as follows.

Chapter 3 (DELETE)

Chapter 4 EQUIPMENT FOR THE PREVENTION OF DISCHARGE OF NOXIOUS LIQUID SUBSTANCES

4.1 General

4.1.1 Application

Sub-paragraph -1 has been amended as follows.

1 The requirements of this chapter apply to equipment for the prevention of discharge of noxious liquid substances provided in ships carrying noxious liquid substances in bulk in accordance with the requirements of **Chapter 2**.

Title of Section 4.2 has been amended as follows.

4.2 Prewashing Systems (*Regulation* 6 of *Annex* II)

4.2.2 Washing Machines

Sub-paragraph -1 has been amended as follows.

1 Where Category *X* substances or solidifying substances are to be carried, washing machines are to be located at such positions as all of the tank surfaces can be washed by taking into account the washing fluid pressure, capacity and reach of injection flow; where Category *Y* substances are to be carried, washing machines are to be located at appropriate positions, so that tank washing is performed by rotary jets operated by a sufficiently high hydraulic pressure.

Paragraph 4.2.4 has been amended as follows.

4.2.4 Wash Water Heating System

To ships intended to carry solidifying substances or those with a viscosity of 50mPa.s or more at 20 ℃, the wash water heating system is to be provided so that washing can be done with hot water at a temperature of 60 ℃ or more, unless the properties of all of such substances make the washing less effective.

Title of Section 4.3 has been amended as follows.

4.3 Stripping System (*Regulation* 5 of *Annex* II)

Paragraph 4.3.2 has been amended as follows.

4.3.2 Capacity of Stripping System

The stripping system is to be capable of reducing noxious liquid substances to the volumes shown in **Table 4-3** according to the date of keel laying of the ship and the classified category of noxious liquid substance.

Table 4-7 has been renumbered to Table 4-3.
Table 4-3 has been amended as follows.

Table 4-3 Capacity of stripping system

Category of ship	The quantity of stripping residue		
	Category *X* substance	Category *Y* substance	Category *Z* substance
Ships at beginning stage of construction before 1 July 1983	$0.3m^3$ or less	$0.3m^3$ or less	$0.9m^3$ or less
Ships at beginning stage of construction on and after 1 July 1983 before 1 January 2007	$0.1m^3$ or less	$0.1m^3$ or less	$0.3m^3$ or less
Ships at beginning stage of construction on and after 1 January 2007	$0.075m^3$ or less	$0.075m^3$ or less	$0.075m^3$ or less

Remark

1. For a ship other than a chemical tanker constructed before 1 January 2007 which cannot meet the requirements for the pumping and piping arrangements for substance in Category *Z* referred to in **Table S18.1 in Part S of the Rules for the Survey and Construction of Steel Ships** no quantity requirement shall apply. Compliance is deemed to be reached if the tank is emptied to the most practicable extent

Paragraph 4.4.2 has been amended as follows.

4.4.2 Arrangements of Discharge Outlets (*Regulation* 12 of *Annex* II)

1 Ships certified to carry substances of Category *X*, *Y* or *Z* shall have an underwater discharge outlet. For ships constructed before 1 January 2007 and certified to carry substances in Category *Z* an underwater discharge outlet is not mandatory.

2 The underwater discharge system is to be located within the cargo area in the vicinity of the turn of bilge to prevent the redrawing of noxious liquid substance through the sea water intake

of the ship.

Title of Paragraph 4.4.3 has been amended as follows.

4.4.3 Size of Discharge Outlets (*Regulation* 12 of *Annex* II)

Section 4.5 has been deleted.
Section 4.6 has been renumbered to 4.5.

Sections 4.7 and 4.8 have been deleted.
Sections 4.9 and 4.10 have been renumbered to 4.6 and 4.7.

Title of Section 4.6 has been amended as follows.

4.6 Ventilated Washing System (*Appendix* 7 of *Annex* II)

4.6.4 Application of the Rules for the Survey and Construction of Steel Ships

In Paragraph 4.6.4, the wording “4.9” in main text has been amended as “4.6”.

Part 5 SHIPBOARD OIL POLLUTION EMERGENCY PLANS

Chapter 2 TECHNICAL REQUIREMENTS

Section 2.3 has been newly added as follows.

2.3 Additional Requirements for Oil Tankers of 5,000 *tonnes* deadweight and above

2.3.1 Shore-based Support

All oil tankers of 5,000 *tonnes* deadweight or more are to have prompt access to computerised, shore-based damage stability and residual structural strength calculation programs.

Part 6 SHIPBOARD MARINE POLLUTION EMERGENCY PLAN FOR NOXIOUS LIQUID SUBSTANCES

Chapter 1 GENERAL

1.1 General

1.1.2 Equipment Requirements

Main text has been amended as follows.

> Every ship of 150 *gross tonnage* and above certified to carry noxious liquid substances in bulk is to carry on board permanently a Shipboard Marine Pollution Emergency Plan for Noxious Liquid Substances approved by the Society in a place where it is ready for immediate use.

Appendix I GUIDANCE FOR THE DISCHARGE OF NOXIOUS LIQUID SUBSTANCES, ETC.

1.1 General

1.1.1 Application

Main text has been amended as follows.

This *APPENDIX* gives a reference for approving a procedures and arrangements manual for the discharge of noxious liquid substances, which is required in **2.2.1-5 of Part 4 of the Rules**, by giving guidance for discharging noxious liquid substances or those provisionally assessed as their equivalents and ballast water, tank washings or other residues or mixtures containing preceding noxious liquid substances (hereinafter referred to as the "noxious liquid substances, etc." in this *APPENDIX*) by using the construction and equipment specified in **Part 4 of the Rules** for the Survey and Construction of Marine Pollution Prevention Installations.

Paragraph 1.1.2 has been amended as follows.

1.1.2 Discharge from Ships en route (*Regulation* 13 of *Annex* II)

The discharge into the sea of noxious liquid substances, etc. when the ship is proceeding en route is to be prohibited except when all the following conditions are satisfied:

(1) The ship is proceeding en route at a speed of at least 7 *knots* in the case of self-propelled ships or at least 4 *knots* in the case of ships which are not self-propelled;

(2) The discharge is made below the waterline through the underwater discharge outlet not exceeding the maximum rate for which the underwater discharge outlet is designed. However, for ships constructed before 1 January 2007 the discharge into the sea of residues of substances in Category *Z* or of those provisionally assessed as such or ballast water, tank washings or other mixtures containing such substances below the waterline is not mandatory;

(3) The discharge is made at a distance of not less than 12 *nautical miles* from the nearest land of any one state;

(4) The discharge is made in a depth of water of not less than 25*m*.

Paragraph 1.1.3 has been amended as follows.

1.1.3 Noxious Liquid Substances, etc. Removed by Ventilation Procedures (*Regulation* 13.3 of *Annex* II)

The requirements of this *APPENDIX* may not apply when the discharge is made of the water filled into the tank after using the ventilation procedures complying with the requirements of **4.6 of Part 4 of the Rules** for removing the cargo residues from the tank.

Section 1.2 has been amended as follows.

1.2 Discharge of Noxious Liquid Substances

1.2.1 Category *X* Noxious Liquid Substances, etc.

The discharge into the sea of Category *X* noxious liquid substances, etc. is to be prohibited. If tanks containing such substances or their mixtures are to be washed, the resulting residues are to be discharged to a reception facility until the concentration of the substance in the effluent to such facility is at or below 0.1% by weight and until the tank is empty. Provided that the residue then remaining in the tank is subsequently diluted by the addition of a volume of water, it may be discharged into the sea in accordance with **1.1.2**.

1.2.2 Category *Y* and *Z* Noxious Liquid Substances, etc.

1 With respect to residue discharge procedures for substance in low viscosity and non-solidifying property of Category *Y*, and Category *Z* the discharge standards in **1.1.2** shall apply. If the unloading of a substance in low viscosity and non-solidifying property of Category *Y*, and Category *Z* is not carried out in accordance with the approving a for procedures and arrangements for discharge of noxious liquid substances, a prewash shall be carried out and be discharged to a reception facility at the port of unloading. When a reception facility at another port is available, that reception facility is available.

2 High-Viscosity or Solidify Substances in Category *Y* should not be discharged into the sea. A prewash procedure as specified in **4.2 of Part 4**, and the residue/water mixture generated during the prewash shall be discharge to a reception facility until the tank is empty. Any water subsequently introduced into the tank may be discharged into the sea in accordance with the discharge standard in **1.1.2**.

1.2.3 Noxious Liquid Substances, etc. of Undefined Category (*Regulation* 13.1 of *Annex* II)

The discharge into the sea of "noxious liquid substances, etc." and "liquid substances, etc. other than noxious liquid Substances" defined in **1.4** is to be prohibited.

1.3 Discharge of Noxious Liquid Substances, etc. in Antarctic Area

"Antarctic Area" means the sea area south of latitude 60°S. In the Antarctic area any discharge into the sea of Noxious Liquid Substances or mixtures containing such substances is prohibited.

1.4 Liquid Substances, etc. other than Noxious Liquid Substances

The discharge into the sea of substances considered to be harmless for the human health, marine resources and amenity, and other lawful utilization of the sea is not subject to controls. These substances are listed in Table S17.1 and Table S18.1 in Part S of Rules for the Survey and Construction of Steel Ships with an entry "OS" in column 'c' in those table

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 January 2007.

GUIDANCE FOR MARINE POLLUTION PREVENTION SYSTEMS

GUIDANCE

2006 AMENDMENT NO.2

Notice No.68 3rd October 2006

Resolved by Technical Committee on 6th July 2006

Notice No.68 3rd October 2006
AMENDMENT TO THE GUIDANCE FOR MARINE POLLUTION PREVENTION SYSTEMS

"Guidance for marine pollution prevention systems" has been partly amended as follows:

Part 1 GENERAL

Chapter 1 GENERAL

1.1 General

Sub-paragraphs -3 and -4 have newly added as follows.

3 The wording "the requirements separately provided by Society" in **1.1.2-2 in Part 1 of the Rules** means liquefied gas carriers in bulk intended to carry noxious liquid substances, at beginning stage of construction before 1 July 1986, and complying with the requirements noted in the right-hand column according to the classified division of ships. Ships converted into liquefied gas carriers in bulk are dealt with as the liquefied gas carriers in bulk constructed on the date when the conversion work was commenced, irrespective of the date of construction.

4 The requirements of **1.1.2-2(4) in Part 1 of the Rules** may be modified where deemed appropriate by the Society.

Table 1.1.1-2 has been newly added as follows.

Table 1.1.1-2

Classification of ships	Applicable Code
A ship for which contract is placed after 31 October 1976; or in the absence of a contract constructed or ships at beginning stage of construction before 1 July 1983; or a ship completed after 30 June 1984	*GC* Code (1)
Ship other than the above	*EX* Code (2) (3)

Note

(1) *GC* Code is *IMO* Resolution *A*. 328(IX) "Code for the Construction and equipment of Ships Carrying Liquefied Gases in Bulk" (including up the amendments)adopted on 12 November 1975.

(2) *EX* Code is the "Code for Existing Ships Carrying Liquefied Gases in Bulk" (including up to the amendments) adopted at *IMO* on 12 November 1975.

(3) Ships completed after 31 October 1976 and before 30 June 1980 are to comply with the *GC* Code as far as practicable.

Part 2 SURVEYS

Chapter 2 REGISTRATION SURVEYS

2.1 Registration Surveys during Construction

2.1.2 Submission of Plans and Documents for Approval

In Sub-Paragraph -1(1)(h), the wording "(limited to the case only for tank carrying category *A* substances, fitted with web frames and struts)" has been amended as "(limited to the case only for tank carrying category *X* substances or solidify substances, fitted with web frames and struts)".

In Sub-Paragraph -1, Sub-Paragraphs (4), (6) and (7) have been deleted.
In Sub-Paragraph -1, Sub-Paragraphs (5) and (8) have been renumbered to (4) and (5).

In Sub-Paragraph -2(1)(b), the wording "(tank washing machines, devices for recording discharge of oil residues, and ventilation systems)" has been amended as "(tank washing machines and ventilation systems)".

In Sub-Paragraph -2(2), Sub-Paragraph (f) has been deleted.
In Sub-Paragraph -2(2), Sub-Paragraphs (g) through (l) have been renumbered to (f) through (k).

2.1.3 Inspections of Construction and Equipment

Sub-paragraph -3 has been amended as follows.

3 Inspection procedures for equipment for the prevention of discharge of noxious liquid substances in ships carrying noxious liquid substances in bulk are to be in accordance with the following procedures **(1)** to **(3)** :

(1) The Registration Surveys of prewashing system specified in **2.1.3-3(1)(a) in Part 2 of the Rules** is to be carried out by operating the system correspondingly in accordance with the washing procedure specified in The Annex II of The International Convention for the Prevention of Pollution from Ships, 1973, as modified by Protocol of 1978 relating thereto (hereinafter referred to as the "*Annex* II " in this Guidance)

(2) The wording "water test by an approved procedure" specified in **2.1.3-3(2)(b) in Part 2 of the Rules** means the test procedure approved by the Society on the basis of the procedure specified in Appendix *5* of the *Annex* II.

(3) The Registration Surveys of ventilated washing system specified in **2.1.3-3(8)(a) in Part 2 of the Rules** is to be carried out by operating the system correspondingly in accordance with the wash procedure specified in Appendix *7* of the *Annex* II.

Part 3 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL

Chapter 1 GENERAL

The title of section 1.1 has been amended as follows.

1.1 Application and Terminology

1.1.1 Application

Sub-paragraph -2 has been renumbered to -3, and sub-paragraph -2 has bee added as follows.

2 For the purpose of **1.1.1-3 in Part 3 of the Rules**, the provisions of **Part 3 of the Rules** apply to ships or fixed or floating platforms used for the offshore production, storage and offloading of oil, etc. taking account of "*Guidelines for the application of the revised MARPOL ANNEX I requirements to floating production, storage and offloading facilities (FPSOs) and floating storage units (FSUs)*", adopted by *IMO* resolution *MEPC*.139(53) as may be amended.

In the main text of sub-paragraph -3, the term "(1) to (8)" has been replaced with "(1) to (6)".

Sub-paragraphs -3(4) and (5) have been deleted, and sub-paragraphs (6) to (8) have been renumbered to (4) to (6) respectively.

Table 3-1-1-1 has been deleted.

Chapter 2 EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL FROM MACHINERY SPACES

In the title of section 2.3, reference regulation has been deleted.

Chapter 3 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY OIL CARRIED IN BULK

3.2 Hull Construction

3.2.1 Arrangements of Bulkheads in Spaces Carrying Cargo Oil

Sub-paragraphs -1 to -5 have been renumbered to -3 to -7 respectively, and sub-paragraphs -1 and -2 have been added as follows.

1 The provisions of the oil outflow parameter specified in **3.2.1-1 in Part 3 of the Rules** is provided based on symmetrical tank arrangements, and therefore all "*y*" dimensions, as specified in **3.2.1-1(8) in Part 3 of the Rules**, are to be measured uniformly from the same one side of the ship for all tanks of the ship. For asymmetrical arrangements, the oil outflow parameter is to be determined as an average of two outflow values when "*y*" dimensions are measured from the starboard and port sides.

2 With respect to the rigorous calculations specified in **3.2.1-1(10) in Part 3 of the Rules**, reference is to be made to "*Explanatory Notes on matters related to the accidental oil outflow performance*", adopted by *IMO* resolution *MEPC*.122(52).

In the main text of sub-paragraph -3, reference regulation of "3.2.1(1) in Part 3 of the Rules" has been replaced with "3.2.1-2(1) in Part 3 of the Rules".

In sub-paragraph -4, reference regulation of "3.2.1(2) in Part 3 of the Rules" has been replaced with "3.2.1-2(2) in Part 3 of the Rules".

In sub-paragraph -5, reference regulation of "3.2.1(2)(c)iii) in Part 3 of the Rules" has been replaced with "3.2.1-2(2)(c)iii) in Part 3 of the Rules".

In sub-paragraph -6, reference regulation of "3.2.1(4) in Part 3 of the Rules" has been replaced with "3.2.1-2(4) in Part 3 of the Rules".

In the main text of sub-paragraph -7, reference regulation of "3.2.1(6) in Part 3 of the Rules" has been replaced with "3.2.1-2(6) in Part 3 of the Rules".

3.2.4 Prevention of Oil Pollution in the Event of Collision or Stranding

Sub-paragraphs -1 and -2 have been renumbered to -2 and -3 respectively, and sub-paragraph -1 has been added as follows.

1 For the purpose of the provisions of **3.2.4 in Part 3 of the Rules**, oil tankers with independent tanks and carrying oil cargoes in such tanks only are considered as double-hull oil tankers, provided that they are designed and constructed to be such that the minimum distance between the cargo tank boundaries and ship bottom and side-shell plating comply with the provisions of

3.2.4 in Part 3 of the Rules.

In sub-paragraph -2, reference regulation of "3.2.4(3)(a) in Part 3 of the Rules" has been replaced with "3.2.4(2)(a) in Part 3 of the Rules".

Paragraph 3.2.5 has been newly added as follows.

3.2.5 Cargo Pump-Room Protection

1 For the purpose of the provisions of **3.2.5 in Part 3 of the Rules**, the double bottom protecting the cargo pump-room is to be a void or a ballast tank. Unless prohibited by other regulations, such double bottom may be a fuel oil tank.

2 With respect to the provisions of **3.2.5 in Part 3 of the Rules**, ballast piping may be permitted to be located within the cargo pump-room double bottom provided any damage to that piping does not render the ship's pumps located in the cargo pump-room ineffective.

3.3 Installations and Piping Arrangements

In the title of paragraph 3.3.1, reference regulation has been deleted.

3.3.2 Discharge Arrangements

Sub-paragraph -2 has been renumbered to -3, and sub-paragraph -2 has been added as follows.

2 The term "methods deemed appropriate by the Society" in **3.3.2-2(1) in Part 3 of the Rules** means the provisions of regulation *D*-1.1 of *the International Convention for the Control and Management of Ship's Ballast Water and Sediments*.

Part 4 CONSTRUCTION AND EQUIPMENT FOR THE PREVENTION OF POLLUTION BY DISCHARGES OF NOXIOUS LIQUID SUBSTANCES IN BULK

Chapter 1 has been deleted.

Chapter 2 has been newly added as follows.

Chapter 2 CONSTRUCTION AND EQUIPMENT

2.2 Requirements for Installation of Construction and Equipment

2.2.1 Equipment for the Prevention of Discharge of Noxious Liquid Substances

1 The Manual for procedures and arrangements for discharge of noxious liquid substances in **2.2.1-5 in Part 4 of the Rules** shall have a standard format in compliance with Appendix *4* to *Annex* II. In the case of a ship engaged in international voyages on which the language used is not English, French or Spanish, the text shall include a translation into one of these languages.

2 The Cargo record book in **2.2.1-6 in Part 4 of the Rules** shall have a format in compliance with Appendix 2 to *Annex* II.

Chapter 3 has been deleted.

Chapter 4 EQUIPMENT FOR THE PREVENTION OF DISCHARGE OF NOXIOUS LIQUID SUBSTANCES

Section 4.2 has been newly added as follows.

4.2 Prewashing Systems

4.2.1 General

Prewashing systems **in 4.2.1 in Part 4 of the Rules** are to be taken into account the Prewash Procedures in Appendix 6 to *Annex* II.

Sections 4.5 and 4.6 have been deleted.
Sections 4.9 and 4.10 have been renumbered to 4.6 and 4.7.

4.7 Segregated Ballast Tanks

4.7.1 General

For ships with length L_f of 50 *m* or less among ships not engaged in international voyages, the capacity of segregated ballast tanks may comply with the conditions specified in **Table 4.4.7-1** using the following conditions.

Moulded draught amidships $\geq 0.200 + 0.032\,L_f \quad (m)$

Aft trim $\leq (0.024 - 6\times10^{-5}\,L_f)L_f \quad (m)$

Table 4.4.7-1 Capacity requirements for segregated ballast tanks

Case	Moulded draught amidships	Aft trim	Additional requirements
1	○	○	-
2	○	×	Fwd draught $> 0.025L_f$
3	○	×	Fwd draught $\leq 0.025L_f$ To comply with **16.4.4(1) in Part C of the Rules for the Survey and Construction of Steel Ships**

(Remark)
○ : The relevant requirements are complied with.
× : The relevant requirements are not complied with.

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 January 2007.