Engine Circular No. 32

NO: ENG/MISC-29(32)/2003

Dated June 18, 2004

Sub: Additional Guidelines on the provision of Adequate Reception Facilities

(Reference: Engineering Circular No. 31)

As per the Merchant Shipping Act, 1958 , section 356 I, oil reception facilities are to be provided at ports in India. The purpose of these guidelines is to give guidance to ports, terminal operators and others on the requirements for reception facilities and how to meet them.

Determination of requirements

2.1 The following give a guide to the size of reception facilities, which are likely to be required, by each type of port. However it should be borne in mind that can only be a guide. Local trading patterns may cause some variation and such circumstances should be taken into account when calculating the size of facilities required.

2.1.1 Crude oil loading ports

Tankers which immediately prior to loading have completed a ballast voyage of not more than 72 hours and not more than 1200 nautical miles are expected to need to discharge dirty ballast equivalent to 30% of their deadweight. Tankers which have just completed longer ballast voyages should not need any facilities for cargo residues or oily mixtures but some provision may be needed at ports where the discharge of clean ballast is prohibited or at which tankers may be expected to have encountered weather conditions which have prevented oily-water separation on voyage.

2.1.2 Bulk product loading ports

The recommended base figure for the provision of reception facilities is 30% deadweight for dirty ballast from product tankers.

2.1.3 Ports with repair yards or tank cleaning facilities

Although estimates of the quantities of oily mixtures and residues, which such ports may be,

required to provide for are given below. It must be emphasized that a detailed local investigation of the existing and expected pattern of ships calling at repair yards and tank cleaning facilities would give a better indication. The following are suggested as a guide to the amounts, which reception facilities may have to deal with:

2.1.3.1 For crude oil tankers

Up to 30% of deadweight as dirty ballast'

> A variable amount of wash water from in-port tank washing, possibly in the range of 4-8% of deadweight.

Up to, and possibly exceeding, 1% of deadweight as liquid oil residues"

> An amount of oily solids which may have to be lifted from the cargo tanks. These amounts vary considerably depending upon tank cleaning procedures and can range from 0.01% to approximately 0.10% of the deadweight of the vessel.

A tanker which has been able to carry out its own tank cleaning en route to the port should arrive with clean ballast and with its residues wholly accumulated in its slop tank(s). these accumulated residues would require to be discharge to the reception facility with due provision being made for the residues' likely waxy, viscous and emulsified nature. The slop tank would require to be cleaned and the washings passed to the reception facility.

2.1.3.2 For black product tankers

Same as for crude carriers, except that the total black product liquid residues are not likely to exceed 0.5% of deadweight.

2.1.3.3 For white product tankers

Same as for crude carriers, except that the total white product liquid residues are likely to exceed 0.2% of deadweight and that there will usually be substantially smaller quantities of wash water.

Whereas crude oil and black product liquid residues, once de-watred, may be disposed of as fuel or for-re-refining as may be found locally appropriate, disposal avenues for white oil

residues may be more restricted because of their widely varying components and volatility.

2.1.3.4 All ships

Means should be provided for the acceptance of oily ballast water from bunker tanks and the wash water and residues which result from the cleaning of bunker tanks and sludge tanks. The quantities involved will be greatly dependent upon the size and type of ships catered for and obviously can only be assessed locally.

2.1.4 Ports which handle ships with sludge tanks

All ports should estimate the proportion of ships arriving with diesel propulsion and using residual fuel. Throughout the world such ships form a very high proportion of the total of ocean going ships. The normal rate of sludge accumulation from fuel oil is no more than 3% of fuel used.

2.1.5 All ports

All ports will need some facilities for the discharge of oily bilge water especially if the discharge of any bilge water is prohibited while the ship is in the harbour area. Figures for bilge water accumulation at sea ranging from 1 to 15 tonnes per day for ocean tonnage and from 0.1 to 3 tonnes per day for coastal tonnage have been quoted as typical for well run vessels; however the rate of bilge water accumulated in port is likely to be substantially less.

There is also a need to provide capacity to accept dirty water from ballast tanks and from bunker fuel tanks. Although Annex 1 of MARPOL 73/78 prohibits large new ships from ballasting bunker fuel tanks, many existing ships must ballast their fuel tanks. Some 50% to 60% of sea going ships may sometimes be faced with this requirement and provision will be needed at most ports.

2.2 The capacity required will have to be assessed individually for each port.

Note: In the case of Combination Carriers (oil-bulk-ore and oil-ore carrier) Annex 1 of MARPOL 73/78 requires reception facilities for oil residues to be provided at ports loading bulk cargoes. The quantity of liquid oil residues on combination carriers can be expected to be similar to that on crude oil tankers (ie up to , and possibly exceeding, 1% of dwt). However, the smooth and flush internal design of cargo tanks on combination carriers can result in a reduction of residues as compared with crude

carriers, and an average of 0.5% of dwt of oil residues can be anticipated on combination carriers after tank washing.

Combination carriers required to load dry bulk cargo after a short ballast voyage from an oil discharge port will need reception facilities at the bulk loading port adequate to accept some 30% of ship dwt as dirty ballast.

Modern combination carrier designs incorporate slop tanks, fitted with inert gas equipment, to receive tank washings and oily residues. This may minimize the need for reception facilities at bulk loading terminals.

B. Guidelines in respect of residues and mixtures containing Noxious Liquid substances

1.1 The Purpose of the Guidelines is to indicate to ports and terminals what is required in order to provide facilities that are adequate for the purposes of the reception facilities Order. The standards of adequacy must meet requirements under regulation 7 of Annex II of MARPOL 73/78 in providing for needs of ships without causing undue delay. The Guidelines amplify the Annex II general requirements for reception facilities and provide estimates of the quantities of mixtures of water and noxious liquid substance residues expected to be generated by ships prewashing cargo tanks in accordance with Annex II, including the standards,* and which are required to be discharge to a reception facility.

1.2 These Guidelines are based on regulation 7 and take into account regulation 5, 5A, and 8 of Annex II of MARPOL 73/78 and the standards which require that ships unloading certain chemical cargoes use equipment and procedures to reduce the quantity of noxious liquid substance residues to amounts not necessitating the use of reception of facilities . this allows for the discharge of these residues at sea without harm to the marine environment or, in the case of those noxious liquid substance residues which must be transferred ashore, it minimizes the mandatory requirements for reception faculties. For Category A substances and Category B and C high viscosity or solidifying substances, * a mandatory prewash of the cargo tank and transfer of the residues ashore, generally in the unloading port, is required. By clearly identifying the noxious liquid substances and circumstances which require prewshing and discharge to a reception facility, it is possible for each port or terminal to determine the need for facilities . (Category A, Category b and category C substances are defined in SI 1987/551 and listed in SI 1990 No. 2604 and include substances

provisionally listed or class approved.)

1.3 Residues and mixtures to be discharged to reception facilities will primarily result from prewash tank cleaning and to an almost negligible extent from cargo pump room bilge stops.

1.4 No port or terminal is required to receive residue / water mixtures containing substances other than those handled by the port or terminal.

1.5 To be adequate, reception facilities should be as follows:

1.5.1 That as a minimum, the capacity of reception facilities at cargo unloading, loading, and repair ports and terminals should be capable of receiving those residues and mixtures which are handled within the port and are required by Annex II and the Standards to be discharged to reception facilities, bearing in mind section 2 of this part of these Guidelines;

1.5.2 That the receiving capability be at least appropriate with respect to the time ships normally spend at ports or terminals and sufficiently available to respond to the continuing needs of ships using the port without causing undue delay; and

1.5.3 In order to permit discharge of residues and mixtures without causing undue delay to ships, satisfactory arrangements should be made for communication between the ship and the reception facility so as to enable prior notification of substances and quantities expected for discharge. Piping or equipment required for discharge etc. should also be satisfactory for connection to the ship.

1.6 To identify more precisely the reception facility needs of ports and terminals, section 2 of this Part of these Guidelines sets out separately the facilities required for unloading ports, repair ports, and loading ports. In addition section 3 of this Part of the Guidelines addresses the provision of reception facilities which are not required by Annex II of MARPOL 73/78, but which a port may wish to provide to improve its service to ships.

2. RECEPTION FACILITIES FOR NOXIOUS LIQUID SUBSTANCES REQUIRED AS A CONSEQUENCE OF THE APPLICATION OF ANNEX II OF MARPOL 73/78

2.1 This section provides specific guidance for compliance with the requirements for

reception facilities and provided estimates of the average quantities of residues and mixtures generated on chemical tankers.

2.2 Assumptions

2.2.1 In estimating the quantities required to be received by reception facilities the following

assumptions are made**:**

2.2.1.1 The ship will be operated in a manner which will ensure that residues of substances remaining after cargo unloading are the minimum consistent with the design of the ship and the properties of the substance and that the ship complies with the cargo unloading procedures of its Procedures and Arrangements Manual;

2.2.1.2 When determining the capacity of reception facilities, no allowance need be made for providing excess capacity to account for the operational efficiency of ships or unusual situations where, through vessel equipment malfunctions or operational difficulties, unexpected quantities of residues of noxious liquid substances may result (the provision for such situations is covered in paragraph 3.2.4.)

2.2.1.3 Reception facility capacity determinations do not include the capacity needed for ships which have been issued an exemption to the mandatory prewash requirements in regulation 17 of SI 1987 / 551 (regulations 5A(6) and 5A(7) of Annex II of MARPOL 73/78);

2.2.1.4 Regulations 4 and 8 of SI 1987/551 (regulation 8 of annex II of MARPOL 73/78) requires that any residue / water mixtures should discharged in the unloading port, unless in accordance with these Regulations (regulations 8(2) (b) (ii), 8(5) (b) (ii). 8(6) (c) (ii), 8(7) (c) (ii), the residue / water mixtures are discharged in another port;

2.2.1.5 The unloading terminal will provide arrangements to facilitate stripping in accordance with regulation 7(3) of annex II of MARPOL 73/78; and

2.2.1.6 Cargo pump room bilge quantities will be negligible when compared to other capacity requirements.

2.3 Unloading Port and Terminal Requirements

2.3.1 Except when one of the exemption provisions of regulation 8 applies, reception facilities should be available * at unloading ports receiving the following substances (including substances provisionally assessed or class approved);

2.3.1.1 Category A substances;

2.3.1.2 Category B substances with a viscosity equal to or greater than 25 mPa.s at 20^0 C;

2.3.1.3 Category B substances with melting points equal to or greater than 0^0C

2.3.1.4 Category C substances with a viscosity equal to or greater than 60mPa.s at 20^0C; and

2.3.1.5 Category C substances with melting points equal to or greater than 0^0C.

The method of estimating the volume of residue / wash water mixture generated by the required prewashing of cargo tanks is given in section 2.4.

Whether the reception facility need be used to receive a residue / water mixture of a prewash from a tank having contained one of the above listed substances will depend on the unloading temperature for the Category B and Category C substances and for all the above listed substances, on the conditions under which any exemption has been granted.

2.3.2 The requirements for discharging residues of those Category B and C substances identified in paragraphs 2.3.1.2 to 2.3.1.5 above and which are listed in Appendix 1 of these Guidelines depends upon the temperature of the cargo at the time of unloading. This temperature is dependent on the ship's heating equipment or conditions imposed by the shipper or cargo owner. If the temperature of the cargo is sufficiently above the substances melting point as not to be considered a "solidifying substance" as defined in the Standards, paragraph 1.3.7 or sufficiently above the temperature as not to be considered a "high viscosity substance" as defined by the Standards, paragraph 1.3.9 then the substance is treated as a "non solidifying " or a "low viscosity" substance and a prewash and discharge of residue / water mixtures to a reception facility is not required. For the high melting point substances listed the melting point is required to be indicated on the shipping document by BCH Code, $ paragraph 5.2.8 or IBC Code, paragraph 16.2.9. for the high viscosity substances listed the temperature at which the

substance is not considered a “high viscosity substance”, is required to be indicated on the shipping documentby BCH Code, paragraphs 5.2.5 to 5.2.7 or IBC code paragraphs 16.2 to 16.2.8 .

2.3.3. Certain substances which are water reactive , eg toluene diisocyanate, cannot be removed from a tank by means of water washing; instead a solvent must be used. Therefore the washing of these substances from a cargo tank may require additional reception facility capacity.

2.3.4. Regulation 7(3) of Annex II MARPOL 73/78 requires unloading terminals to provide arrangements to facilitate efficient stripping. In order to comply with this requirement the unloading terminals should have the capability to provide a back pressure at the ships manifold which will permit the efficient operation of the approved stripping systems fitted on ships.

2.3.5. Unloading ports and terminals are reminded that hoses and pipeline systems shall not be drained back to the ship after unloading.

2.3.6. Unloading ports and terminals are reminded that every liquid substance carried in bulk by ship is covered by the Regulations referred to in the introduction, or by written permission with the concurrence of the Department, and any requirement for reception facilities should be known to all parties involved in shipments.

2.3.7. Prior to any discharge of a prewash residue / water mixture to a reception facility, the master of a ship is required by the Prevention of Pollution (Reception Facilities) Order 1984 to inform in writing the person providing the reception facility of the quantity and content of any substances discharged. Additionally, where the residue are of the special waste type and these are discharged to a conveyance for transportation directly to reception or disposal facilities outside a harbour area, the master is to complete part C of the modified consignment note required by the Control of Pollution (Landed ships waste) Regulations 1987 (see Part IV of these Guidelines). In all cases, it would be advisable to take and retain samples, one for the ship and one for the operator of the reception facility, of the residue / water mixture discharged.

2.3.8. If an exemption from the requirement to prewash in the unloading port is to be granted, the Department must be satisfied with the reception facilities in the alternative port coincidentally with the agreement of any other Administration involved where

appropriate.

2.4 Method for Estimating the Volume of Residue / Water Mixtures Generated by Prewash Tank Cleaning

2.4.1 The method for estimating the capacity of reception facilities in a particular port or terminal should based on the quantities of residue / water mixtures which must be discharged to meet the provisions of Annex II of MARPOL 73/78 . The capacity assessment parameter s include the numbers of chemical tankers, and the substances anticipated to be handled by that port or terminal. The following parameters should be considered in determining the total quantity of residues and mixtures to be received by a reception facility at a particular port or terminal;

2.4.1.1. the number, categories, and types of substances handled by the port in a given period of time;

2.4.1.2. the number of ships' tanks in which these substances are carried ; and

2.4.1.3. the quantity of tank washings which must be discharged to a reception facility

2.4.2 Estimates of the Volume of Residue / Water Mixtures Generated by Prewash Tank Cleaning Requirements.

The following sub-paragraphs provide estimates of the volume of residue / water mixtures generate by a prewash of a cargo tank in accordance with Annex II of MARPOL 73/78 and the Standards. The estimated volumes have been calculated from the requirements in the Standards as to the amount of residue / water mixtures generated during tank washing, plus an additional amount of water to flush pipelines, pumps, filters and piping. These figures represent average conditions and therefore present only estimates. Deviations will also exist particularly when special washing procedures are required (eg substances which cannot be washed with water). The substances and their assigned categories are given in Appendix II to Annex II of MARPOL 73/78. For the definition of solidifying substances, refer to the Standards and paragraph 2.3.2 of these Guidelines. The lower estimated volume of residue / water mixtures applies to tanks 500m and the higher estimated volume applies to tanks of 3,000m or more. For tank sizes between the range limits, a proportional volume of residue / water mixture may be expected. For tank sizes significantly less than

500m^3 a smaller volume of residue / water mixtures may be expected.

2.4.2.1 Category A substances where the final effluent concentration must be equal to or less than 0.10% by weight.

Estimated volume of residue / water mixtures per tank:

Non-solidifying substances 10m^3 to 25 m^3
Solidifying substances 20 m^3 to 50 m^3

2.4.2.2. Category A substances where the final effluent concentration must be equal to or less than 0.01% by weight.

Estimated volume of residue / water mixtures per tank

Non solidifying substances 20 m^3 to 50 m^3
Solidifying substances 30 m^3 to 75 m^3

2.4.2.3. Category B substances with a viscosity equal to or greater than 25mPa.s at 20'C

Estimated volume of residue / water mixtures per tank 5 m^3 to 10 m^3

2.4.2.4 Category B substances with a melting point equal to or greater than 0'C

Estimated volume of residue / water mixtures per tank 10 m^3 to 20 m^3

2.4.2.5. Category C substances with a viscosity equal to or greater than 60 mPa.s. at 20'C.

Estimated volume of residue / water mixtures per tank 5 m^3 to 10 m^3

2.4.2.6 Category C substances with a melting point equal to or greater than 0'C

Estimated volume of residue / water mixtures per tank 10 m^3 to 20 m^3

2.5 **Ship Repair ports requirements**

2.5.1 Ship repair ports undertaking repairs to chemical tankers should have facilities

adequate for the reception of residues and mixtures containing noxious liquid substances as would remain for disposal from ships carrying them as a result of the application of Annex II of MARPOL 73/78.

2.5.2 In the normal course of events, and as a consequence of the application of Annex II of MARPOL 73/78, chemical tankers have the opportunity to effect tank cleaning before calling at a repair port and should be expected to arrive with clean cargo tanks before major repairs or drydocking. Therefore, unless a repair port (or a repair yard) wishes to accept ships with dirty tanks, the prior provision of reception facilities will not be necessary. If it does accept ships with dirty tanks, paragraphs 2.6.3 and 3.2.2 apply.

2.6 Loading Port and Terminal requirements

2.6.1 For ports where chemical tankers load only, there would, as a consequence of the operational requirements of regulation 8 of Annex II of MARPOL 73/78, ordinarily be no demand to provide reception facilities. In normal circumstances, as chemical tanker will either conduct a mandatory prewash and discharge the residues/water mixtures to reception facilities in the unloading port, or, as allowed, discharge other residue/ water mixtures into the sea.

2.6.2 However, in exceptional cases, for example where it has been agreed and confirmed in writing that the loading port will and can receive residue/water mixtures containing noxious liquid substances from certain ships in accordance with regulation 17 of S1 1987/551 (regulation 8(2) (ii), 8 (5) (b) (ii), 8(6)(c)(ii) and 8(7)(c)(ii) of MARPOL 73/78 Annex II), appropriate facilities should be provided.

2.6.3 Residues expected in such ports, as identified in Paragraph 2.6.2 above, may be of those substances listed in Appendix 1 of these guidelines. Volumes of residue/water mixtures may be expected to be in excess of that of residue/water mixtures generated by prewash since the ships may wish to clean at least some of their cargo tanks to commercial standards.

2.6.4 Owing to the varying parameters involved it is not possible to give general guidance on the quantities or substances involved, since the procedure depends on the loading port’s agreement. Such agreements will be subject to the Department’s approval and

each dealt with on an individual basis.

2.7 General

2.7.1 Analysis of Category A Wash Water

If measurement of concentration of substance in the wash water (effluent) pumped to the reception facility is a procedure approved in a ship's Procedures and Arrangements Manual, and used in a port or terminal when prewashing cargo tanks which have contained Category A Substances, the method of analysis should be rapid and suited to local circumstances and to the satisfaction of the Department of Transport.

3. RECEPTION FACILITIES FOR OTHER TANK WASHINGS CONTAINING NOXIOUS LIQUID SUBSTANCES

3.1 Loading, unloading and repair ports may wish to provide reception facilities for residues of noxious liquid substances over and above those which are required as a consequence of the application of Annex II of MARPOL 73/78. The reasons for a port doing so may be several such as, for example, the extension of an efficient service to ships.

3.2 Ships needing such extra facilities could include:

Chemical tankers which would have to load a full, or nearly full cargo after unloading in that port.

(The ship would in most cases be required to clean its tanks to commercial requirements. Residues being discharged would not only consist of substances listed in Appendix 1 of these Guidelines, but could include all noxious liquid substances, irrespective of category and physical properties);

3.2.1 Chemical tankers arriving at a repair port, subsequent to visiting an unloading port, which have had no opportunity to clean their tanks and dispose of their residues at sea.

(It may be expected that, on such ships, cargo tanks having contained solidifying or high viscosity substances will have been prewashed in the unloading ports. The residue/water mixtures remaining for disposal would be the so-called subsequent tank

washings from all cargo tanks, which may include noxious liquid substances of Category A, B, C and D);

3.2.3 Chemical tankers arriving at a port after a coastal passage preventing them from discharging their residue/ water mixtures at sea.

(Similar residues as set out for the repair ports above);

3.2.4 Chemical tankers which, due to equipment malfunction, structural damage or other difficulties are unable to unload and efficiently strip cargo in accordance with Annex II of MARPOL 73/78 and the Standards or, due to incidents which create waste such as cargo or ballast contamination.

3.3 Owing to the different parameters involved, it is not possible to give general guidance on the quantities or substances involved. However, most ports which contemplate the provisions of reception facilities to cater for such ships will probably be able to draw upon their own expertise.

3.4 It must be noted that although no guidance is given on the quantities of residue/water mixtures involved, it may be anticipated that these would be in excess of those referred to under section 2 above. Not only the prewash water would have to come ashore, but also all subsequent washings necessary for commercial (back loading) and safety (repair ports) considerations. A backloading port may only except residues of substances normally handled within the port. This is not the case, however, for repair port residues of substances normally handled within the port. This is not the case, however, for a repair port where a solution may be the temporary storage of all residue/water mixture ashore. After effecting the necessary repairs the ship could reload these mixtures for disposal under the general provisions at sea.

C. Types of Reception Facilities

1.1 Reception facilities may consist of:

1.1.1 Fixed installations comprising storage tanks with connecting lines to jetties with means for onward disposal from the tanks; or

1.1.2 Mobile facilities, ie tankers whether road, rail, ship or barge,, together with suitable discharge lines provided at the jetty or berth as necessary to enable the ship to

discharge readily to the facility. The mobile facility may be used for subsequent transfer of the tank washing to fixed reception facilities or directly to disposal.

In either case the capacity must be adequate to meet the needs of ships using the ports or terminals.

1.2 Transfer arrangements: Piping arrangements and related control systems from ship to reception facility, whether fixed or mobile, should be adequate to prevent spillage.