INTERNATIONAL MARITIME ORGANIZATION

ASSEMBLY - 12th session
Agenda item 11

Distr.
GENERAL

A XII/Res.495
19 January 1982

Original: ENGLISH

IMO

RESOLUTION A.495(XII)
adopted on 19 November 1981

REVISED SPECIFICATIONS FOR OIL TANKERS WITH DEDICATED CLEAN BALLAST TANKS

THE ASSEMBLY,

RECALLING resolution A.297(VIII) by which it established the Marine Environment Protection Committee and specified the functions and responsibilities of that Committee,

NOTING Regulation 13A of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), concerning requirements for dedicated clean ballast tanks and resolution 14 of the International Conference on Tanker Safety and Pollution Prevention, 1978, which contains the Specifications for Oil Tankers with Dedicated Clean Ballast Tanks,

NOTING ALSO that by the same resolution the Conference requested IMCO to review and revise, as necessary, the Specifications,

NOTING FURTHER that Regulation 13A(4) of Annex I of MARPOL 73/78 provides that every tanker operating with dedicated clean ballast tanks shall be provided with a Dedicated Clean Ballast Tank Operation Manual detailing the system and specifying operational procedures,

RECOGNIZING that the said Manual is not only to provide guidance to the crew of the ship for proper operation of the system, but also to provide information on the system and its operational procedures for the inspectors going on board for inspection in ports,

HAVING CONSIDERED the recommendation made by the Marine Environment Protection Committee at its fourteenth session,

1. ADOPTS:

(a) The revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks, the text of which is set out in Annex 1 to the present resolution, to supersede the Specifications for Oil Tankers with Dedicated Clean Ballast Tanks contained in resolution 14 of the International Conference on Tanker Safety and Pollution Prevention, 1978;

(b) Agreed interpretations of certain of the provisions of the revised Specifications as shown in Appendix 2 to the revised Specifications;

(c) The standard format for the Dedicated Clean Ballast Tank Operation Manual appearing in Annex 2 to the present resolution;

2. URGES Governments to establish, in time for the entry into force of MARPOL 73/78, requirements for the dedicated clean ballast tank arrangements based on the revised Specifications;

3. URGES FURTHER that the requirements to be established by Administrations should not impose requirements over and above those as laid down in the revised Specifications;

4. INVITES Governments:

(a) To use the standard format for the Dedicated Clean Ballast Tank Operation Manual as called for by Regulation 13A of MARPOL 73/78;

(b) To ensure that if the language of the Manual is neither English nor French, the Manual shall include a translation into one of these languages.

ANNEX 1

REVISED SPECIFICATIONS FOR OIL TANKERS WITH DEDICATED CLEAN BALLAST TANKS

1 PURPOSE

1.1 The purpose of these Specifications is to provide specific criteria, operational requirements and control and enforcement procedures for those oil tankers operating with dedicated clean ballast tanks (CBT tankers) as specified in section 2 of these Specifications.

2 APPLICATION

2.1 Under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), these Specifications apply to:

.1 existing crude oil tankers of 70,000 tons deadweight and above until two years after the date of entry into force of MARPOL 73/78 in accordance with Regulation 13(9)(a) of Annex I of MARPOL 73/78;

.2 existing crude oil tankers of 40,000 tons deadweight and above but below 70,000 tons deadweight, until four years after the date of entry into force of MARPOL 73/78 in accordance with Regulation 13(9)(b) of Annex I of MARPOL 73/78; and

.3 existing product carriers of 40,000 tons deadweight and above in accordance with Regulation 13(10) and Annex I of MARPOL 73/78.

2.2 Compliance by these ships with these Specifications shall be shown on the International Oil Pollution Prevention Certificate.

3 INITIAL SURVEY

3.1 The initial survey referred to in Regulation 4 of Annex I of MARPOL 73/78 shall include the verifications of the appropriateness of:

.1 the selection of ballast tanks and pumping and piping arrangements; and

.2 the CBT Operation Manual, i.e. detailed operational procedures including checklist.

3.2 The International Oil Pollution Prevention Certificate shall indicate which tanks are designated as dedicated clean ballast tanks. It shall also state that the master has been supplied with information concerning approved operational procedures (CBT Operation Manual).

4 ON BOARD ARRANGEMENTS

4.1 Dedicated clean ballast tanks

4.1.1 The dedicated clean ballast tanks shall have sufficient capacity to enable the tanker to meet the requirements of Regulation 13(2) of Annex I of MARPOL 73/78.

4.1.2 The selection of the dedicated clean ballast tanks must be such that the hull stresses in the ballast and loaded conditions are to the satisfaction of the Administration.

4.1.3 The ballast carried in dedicated clean ballast tanks (CBT ballast) shall, from the accidental pollution prevention point of view, be carried in wing tanks. However, the Administration may permit the use of centre tanks where it can be shown that significant advantage can be obtained in respect of hull stresses, tank volume or piping arrangements.

4.1.4 Tanks shall be selected so as to require a minimum of involvement of the cargo piping and pumping system.

4.2 Pumping and piping arrangements

4.2.1 The piping system for conveying the CBT ballast shall be such that it can be flushed to a slop tank with water, and shall be so arranged that oily water does not enter any dedicated clean ballast tank when the piping system is flushed.

4.2.2 The piping system(s) of each dedicated clean ballast tank must, not later than 1 July 1983, have at least two valves that isolate that tank from the piping system(s) serving the cargo tank.

4.2.3 The dedicated clean ballast tanks must be connected to the least practicable number of cargo pumps.

4.2.4 The discharge of CBT ballast to the sea is to be monitored by an oil content meter approved by the Administration and sufficient sample points are to be provided in the discharge piping of pumps serving dedicated clean ballast tanks to enable supervision of the oil content in the ballast water being discharged.

5 OPERATIONAL PROCEDURES

5.1 The pumps and piping system conveying CBT ballast shall be flushed with water before clean ballast is loaded, discharged or transferred.

5.2 The water for flushing shall be pumped from a sea chest or dedicated clean ballast tank through the pump and piping system of the dedicated clean ballast tank and then to a slop tank.

5.3 If sections of the piping system for CBT ballast are so arranged that they must be flushed with water from the dedicated clean ballast tanks then the minimum quantity of flushing water to be provided in such tanks at all times shall be the greater of either 10 times the volume of the piping to be flushed or sufficient to provide that level in the tank which would allow the piping to run full of water during the flushing before vortexing starts to admit air into the piping. Alternative methods for the retention of clean ballast required by this paragraph shall be to the satisfaction of the Administration.

5.4 After the loading, discharging or transferring of clean ballast the valves specified in paragraph 4.2.2 shall be shut and the piping system drained.

5.5 The overboard discharge of all CBT ballast shall be monitored by an oil content meter.

5.6 The simultaneous discharge of clean ballast while loading cargo or the simultaneous loading of clean ballast while discharging cargo shall not be undertaken except where there is an effective two-valve separation between the ballast and the cargo systems or when cargo tanks are served by individual pumps.

5.7 Ballast water must not be allowed to free fall into ballast tanks into which hydrocarbon gases have leaked. The Dedicated Clean Ballast Tank Operation Manual shall provide either for such tanks to be gas freed before ballasting or for alternative tanks to be used to obviate the danger posed by splashing and free fall of water in tanks containing hydrocarbon gases within the explosive range.

6 DEDICATED CLEAN BALLAST TANK OPERATION MANUAL

6.1 The Dedicated Clean Ballast Tank Operation Manual specified in Regulation 13A(4)(a) of Annex I of MARPOL 73/78 shall contain the following:

.1 the complete text of the revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks;

.2 the drawings of the dedicated clean ballast tank systems;

.3 the description of the systems connected to the dedicated clean ballast tanks including the identity of the dedicated clean ballast tanks and of the slop tank which may be any designated cargo tank;

.4 the dedicated clean ballast tank operation procedures containing specific operational procedures for valve operations, line cleaning and for loading and discharging clean ballast when conducted as follows:

.4.1 prior to arrival and at the loading port;

.4.2 after departure from the loading port;

.4.3 prior to arrival at the final discharge port;

.4.4 in the final discharge port; and

.4.5 after departure from the final discharge port.

In Appendix 1 to these Specifications dedicated clean ballast tank operation procedures are included which apply generally to all tankers operating under the CBT concept;

.5 the checklists for ballasting and de-ballasting dedicated clean ballast tanks;

.6 requirements for the carriage of additional ballast;

.7 compliance procedures for Regulation 9 of Annex I of MARPOL 73/78; and

.8 additional precautions against oil pollution.

7 DOCUMENTS

7.1 The International Oil Pollution Prevention Certificate and the CBT Operation Manual shall at all times be available on board the tanker.

APPENDIX 1

DEDICATED CLEAN BALLAST TANK OPERATION PROCEDURES

1 **Prior to arrival at the loading port**

1.1 The pumping and piping designated for clean ballast operation shall be properly cleaned to permit the discharge of clean ballast in the loading port.

1.2 The valves to the slop tanks and the cargo tanks which are connected to the clean ballast system shall be closed.

1.3 An inspection of all CBT ballast is to be made to ensure that there is no contamination with oil.

1.4 Clean ballast shall be discharged until sufficient quantity remains for safe berthing and for flushing lines if necessary.

1.5 If no further ballast discharge is anticipated in the loading port all valves to the dedicated clean ballast tanks shall be shut and the clean ballast piping drained.

2 **In the loading port**

2.1 After the tanker has been safely berthed ballast may be discharged:

.1 before the cargo is loaded; and

.2 during the loading of cargo either simultaneously or by interrupting the loading provided there is an effective two-valve separation between the cargo and clean ballast system, or when cargo tanks are served by individual pumps.

2.2 Until sufficient clean ballast has been discharged the piping and pumping arrangement servicing the dedicated clean ballast tanks must be kept clean.

2.3 Upon completion of ballast discharge all valves to the dedicated clean ballast tanks are to be shut, the clean ballast piping drained and utilized for the loading of cargo.

2.4 The tanker should be loaded taking into account the requirements of a discharge sequence compatible with the operational procedures for dedicated clean ballast tanks with particular reference to trim and stress levels if the cargo is to be unloaded at two or more discharge ports.

2.5 Slop tanks must be loaded with cargo that will be discharged well before any ballasting operation has to be carried out. If pipe flushing is required during the loaded passage sufficient ullage must be left in the slop tanks to accommodate the necessary flushing water.

2.6 At the completion of loading all valves to the cargo tanks shall be closed.

3 **After departure from the loading port**

3.1 If any clean ballast is to be discharged overboard the pumps and piping serving the dedicated clean ballast tanks are to be flushed into the slop tanks.

3.2 The valves to the slop tanks are to be closed before pumping clean ballast overboard.

3.3 The valves to the dedicated clean ballast tanks are to be closed after discharging ballast.

3.4 During the loaded passage the dedicated clean ballast tanks must be periodically checked for any hydrocarbon gas content and if any gas is detected the tank shall be ventilated until safe for entry and inspected for leakage in bulkheads and piping.

4 Prior to arrival at the final discharge port

4.1 The dedicated clean ballast tanks may be ballasted through clean pumps and piping with sufficient ballast to clear port draught requirements.

4.2 The required amount of water for flushing of the piping may be taken into the dedicated clean ballast tanks overdeck or through clean cargo piping.

5 In the final discharge port

5.1 The cargo discharge and ballasting sequence must be compatible with the operational requirements of dedicated clean ballast tanks.

5.2 Clean ballast may be taken on board:

.1 before the cargo is discharged;

.2 during the discharge of cargo either simultaneously or by interrupting the discharge provided that there is an effective two-valve separation between cargo and clean ballast system or when cargo tanks are served by individual pumps; and

.3 after cargo has been discharged completely.

5.3 When clean ballast is to be taken on board the pumps and piping serving the dedicated clean ballast tanks are to be flushed.

5.4 Upon completion of ballasting all the valves to the dedicated clean ballast tanks shall be closed.

6 After departure from the final discharge port

6.1 Dedicated clean ballast tanks may be topped up using clean pumps and piping.

6.2 The slop tank contents are to be processed in accordance with load-on-top procedures.

6.3 The surface of the CBT ballast is to be periodically inspected for the presence of oil, and the causes of any contaminations carefully investigated.

6.4 After cargo tank cleaning operations the pumps and pipelines to be used for clean ballast shall be flushed.

7 Pump and pipe flushing

7.1 The pipe flushing water must never be passed into dedicated clean ballast tanks.

7.2 Water for flushing pipelines may be drawn from the sea and from the dedicated clean ballast tanks and this will be determined by the configuration of the tanker's piping system.

7.3 When flushing from dedicated clean ballast tanks it is essential that the line has first been thoroughly drained of oil. Flushing should normally start from the tank farthest from the pump. After the line has been primed and suction established, the pumping should be stopped and the valves closed for a period to allow the oil to separate from the pipe walls. Pumping is then resumed at a moderate speed with throttling of the output at the pump's delivery side.

7.4 Water shall first be drawn from individual dedicated clean ballast tanks to clear branch pipes.

APPENDIX 2

AGREED INTERPRETATIONS OF CERTAIN PROVISIONS
OF THE REVISED SPECIFICATIONS

Paragraph 4.1.4 of the revised Specifications

A stripping system may be utilized for clean ballast tank operations provided that the system is flushed before such an operation.

Paragraph 5.1 of the revised Specifications

Where ballast lines independent of the cargo system are used these lines need not be flushed. Whenever, during the loaded voyage, pumps and piping are not to be used for clean ballast handling such lines need not be flushed.

Paragraph 5.3 of the revised Specifications

If a seawater pump and deckline are both entirely separate from the cargo system then this pump and line may be used for filling the dedicated clean ballast tanks with clean ballast or with water for pipe flushing, as appropriate. Such a pump and line may be from a cargo tank water washing system in those ships not provided with a fixed tank washing system.

ANNEX 2

STANDARD FORMAT FOR THE DEDICATED CLEAN BALLAST TANK OPERATION MANUAL

1. The standard format consists of the standard text of the introduction to the Manual, an index and either eight or nine sections, depending on the type of tanker.

2. Appendix 1 of the standard format contains the general guidelines for operation procedures and checklists for the purpose of sections 4 to 8 of the Manual, which should be taken into account by shipowners in preparing and Administrations in approving a Manual for a particular tanker.

3. Appendix 2 of the standard format contains a specimen Manual for a tanker operating with dedicated clean ballast tanks.

Standard text of the introduction

INTRODUCTION

1. This Manual is written in accordance with the requirements of Regulation 13A of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto.

2. The purpose of the Manual is to meet the requirements for tankers operating with dedicated clean ballast tanks (CBT tankers) in accordance with the revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks (IMCO Assembly resolution A.495(XII)). It provides standard operational guidance for CBT tankers.

3. Part 1 of the Manual contains all information and operational instructions required by the Specifications. Part 2 of the Manual contains additional information and operational instructions required by the Administration.

4. This Manual has been approved by the Administration and no alteration or revision shall be made to any part of it without the prior approval of the Administration.

Note: If the Administration requires information and operational instructions in addition to those provided for by the Specifications, they should be included in part 2 of the Manual. If no such additional information or operating instructions are required by the Administration, the Manual will consist of one part only, and paragraph 3 should read: "The Manual contains all the information and operational instructions required by the Specifications".

DEDICATED CLEAN BALLAST TANK OPERATION MANUAL

INDEX OF SECTIONS

Page

Part 1

Part 2

---

* Section 9 is included in the Manual for a particular tanker only if applicable.

SECTION 1. TEXT OF THE SPECIFICATIONS

This section contains the complete text of the revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks.

SECTION 2. DRAWINGS OF THE DEDICATED CLEAN BALLAST TANKS SYSTEMS

This section contains line drawing(s) of systems connected to the dedicated clean ballast tanks showing:

(1) tank arrangements;

(2) cargo pump(s), lines and valves;

(3) ballast systems (where fitted);

(4) stripping systems;

(5) deck service lines used for supplying flush water (where applicable);

(6) sampling points for oil content meter.

SECTION 3. DESCRIPTION OF THE SYSTEMS CONNECTED TO THE DEDICATED CLEAN BALLAST TANKS

This section contains a description of the pumping and piping systems, including valve locations for the cargo, ballast, stripping and slop tank arrangements, associated with the operational requirements of the dedicated clean ballast tanks.

SECTION 4. DEDICATED CLEAN BALLAST TANK OPERATION PROCEDURES

This section contains specific operational procedures for valve operations, line cleaning and for loading and discharging clean ballast when conducted:

(1) prior to arrival and at the loading port;

(2) prior to departure from the loading port;

(3) prior to arrival at the final discharge port;

(4) in the final discharge port;

(5) after departure from the final discharge port.

Any additional procedure used for the operation of the dedicated clean ballast tanks shall be specified.

This section also contains relevant data on safe trim and stress levels for the tanker.

SECTION 5. CHECKLISTS FOR BALLASTING AND DEBALLASTING DEDICATED CLEAN BALLAST TANKS

This section contains operational checklists for the use of the crew in ballasting and deballasting operations which shall include the checking and calibration of oil content meters.

SECTION 6. CARRIAGE OF ADDITIONAL BALLAST

This section contains information and procedures for the carriage of additional ballast, permitted by provisions of Regulation 13(3) of Annex I of MARPOL 73/78.

SECTION 7. COMPLIANCE PROCEDURES FOR REGULATION 9 OF ANNEX I OF MARPOL 73/78

This section contains information and procedures for the discharge of dirty ballast and the decanting of slops at sea to ensure compliance with Regulation 9 of Annex I of MARPOL 73/78.

SECTION 8. ADDITIONAL PRECAUTIONS AGAINST OIL POLLUTION

This section contains information and procedures for dealing with oil contamination of the dedicated clean ballast tanks.

SECTION 9. PROCEDURES FOR CHANGING FROM PRODUCT TRADE TO CRUDE OIL TRADE*

This section contains operational procedures for changing from product trade to crude oil trade for a tanker which is fitted with separate independent pumping and piping arrangements for ballasting dedicated clean ballast tanks, and with a crude oil washing system and which has been issued with two IOPP Certificates running concurrently with one Certificate certifying the tanker to be a crude oil tanker and the other certifying it to be a product carrier.

APPENDIX 1

GENERAL GUIDELINES FOR OPERATION PROCEDURES AND CHECKLISTS FOR THE PURPOSE OF SECTIONS 4 TO 8 OF THE DEDICATED CLEAN BALLAST TANK OPERATION MANUAL

1 **General guidelines for CBT operation procedures** (section 4 of Manual)

1.1 CBT operation requires full appreciation of the procedures and thorough understanding of what is going on at all times. Frequent checks are essential to ensure that contamination or pollution does not occur. These checks include visual observation of the ballast tanks, the piping and valve system, etc. and a general awareness of the possibilities of leakages that may permit oil to enter the ballast system. The items in the procedure which emphasize safety must therefore be followed in full.

1.2 The cargo discharging and ballast handling sequence should be clearly illustrated in a programme worked out by the key personnel involved. The programme should clearly identify the responsibility of all persons involved and should specify in a time-related manner essential facts, such as:

---

* Section 9 is included in the Manual for a particular tanker only if applicable.

- the procedure and the timing for taking the necessary quantity of piping flush water into the ballast tanks;
- the cargo discharging sequence, specifying pumps and lines to be used at each point in the sequence and the projected timetable;
- the procedure and the timing for flushing the ballast piping and taking on ballast: if this is done before the cargo is fully discharged great attention must be paid to the details of the programme so that safe segregation is maintained;
- the procedure for stripping and draining of the cargo tanks, and particularly the cargo pipes, after completion of the discharge.

1.3 The above cargo discharge and ballast handling programme together with the checklist (see section 5 of Manual) and other relevant information should be displayed in the cargo control room or other appropriate place easily accessible to all persons involved.

1.4 During any part of the CBT operation, when quick and reliable communication is required between activities taking place some distance apart, adequate and approved portable radio equipment should be available.

1.5 The tanker should be loaded bearing in mind the requirements of a cargo discharge sequence compatible with the CBT operation.

1.6 When loading cargo that will be unloaded at two or more discharge ports it is important to ensure that this can be done following the CBT procedures and while maintaining safe trim and stress levels.

1.7 Prior to arrival at loading port, the clean ballast may be reduced to berthing condition, using a pump and pipe that have been cleaned or kept clean during the ballast voyage.

1.8 The ballast may be discharged prior to loading or after some cargo has been loaded, depending on the ship and terminal limiting requirements. If cargo has to be loaded prior to deballasting, this must only be done through piping that can be kept separated from the dedicated clean ballast tanks and associated piping.

1.9 Ballast water carried in dedicated clean ballast tanks should be visually checked prior to and during discharge for presence of any oil. If any doubt about the cleanliness of the water during discharge exists, the discharge should be stopped and the remainder retained in the ballast tank or transferred to the slop tank for later discharge to the reception facility or at sea in compliance with Regulation 9 of Annex I of MARPOL 73/78.

1.10 Normal line flushing must be carried out by drawing water from the dedicated clean ballast tanks and discharging to a slop tank. Flush water must never be discharged into a dedicated clean ballast tank. The related method for making flush water available to the ballast tanks for line flushing depends on the piping system and influences the entire CBT procedure for the tanker.

1.11 If the tanker has a separate pump and deck line for water washing of cargo tanks, isolated from the cargo system, this may be used for transferring the necessary amount of flush water to the ballast tanks at any time. Tank washing hoses are used as required between the deck line and the individual tanks. This method can be adopted by most tankers (which have not been built to use fixed, high capacity washing machines) and it offers the most flexible and convenient arrangement. Alternatively, the fire pump and the fire main and hoses or other deck service lines may be used for this purpose, subject to approval by the Administration of the use of the fire-fighting system. The operation can normally be carried out completely independently of the cargo tank activities. The amount of water transferred to the ballast tanks prior to line flushing should always be at least ten times the volume of the pipes to be flushed. There is, however, no disadvantage in taking in more: what is not used for line flushing simply remains in the ballast tanks, becoming part of the departure ballast.

1.12 In vessels which do not have a water supply system suitable for transfer of flush water over deck, flush water must be transferred to the ballast tanks through the cargo piping during the operational stages when the piping is clean. This means that a quantity of flush water has to be left in the ballast tanks at deballasting and subsequently is used for line flushing after the loading of cargo. Similarly a quantity of flush water has to be taken in through the clean piping towards the end of the loaded voyage in order to be used for line flushing after the cargo discharge. A part of the cargo piping thus has to remain flushed and clean during the loaded passage. This procedure requires more control and more careful planning than that described in paragraph 1.11 above which is therefore the procedure to be followed whenever possible.

1.13 For tankers in short haul trades operating on the principle outlined in 1.12 above it may be preferable to leave the necessary quantity of flush water in the ballast tanks throughout the loaded passage. In this case some part of the ballast water is simply left in the tanks at deballasting and used for line flushing after the following cargo discharge. Since a CBT tanker always has unused deadweight capacity, this small dead-freight will normally be of no importance. The effect on tank corrosion should be considered and necessary preventive measures taken.

1.14 When carrying out pipe flushing, water must always be routed from a ballast tank to a slop tank. In addition, in tankers where the piping can be connected as a ring line it is possible to pump water from the sea or from a slop tank through the pipe system and back to a slop tank but water which has passed through an oily pipe section must never be passed to a dedicated clean ballast tank. The amount of pipe flushing water used should be at least ten times the volume of the piping system to be flushed.

1.15 When flushing from ballast tanks containing the prescribed minimum amount of flush water it is important that the line has first been thoroughly drained of oil. Flushing should normally start from the tank farthest from the pump. After the line has been primed and suction established, the pumping is stopped and the valves are closed for a period of about half an hour to allow the oil from the pipe walls to separate out. Pumping is then resumed at a moderate speed, with throttling of the output at the pump delivery side.

1.16 When a ring line can be arranged, water is first drawn from the individual tanks to clear the branch pipes and as the tanks become empty and are closed off from the main line, the inlet to the ring is opened from a slop tank to permit continued closed loop flushing. Towards the end, the inlet should be switched to clean seawater.

1.17 Towards the end of the loaded passage, a normal amount of pipe flushing water is transferred to the CBT tanks, either by use of a clean deck line and related pump or via the cargo piping that has been left clean during the voyage. During short voyages and provided the CBT tanks have adequate corrosion protection, the pipe flushing water left in the tanks prior to loading may be retained in the tanks. This procedure eliminates the need for flushing the cargo piping during the loaded passage. In either alternative, the tanker should have the nominal quantity of pipe flushing water in the CBT tanks when entering the discharge port.

1.18 Before any CBT tank is ballasted a check should be made for any presence of hydrocarbon gases as a result of leakage. This check is also important from the safety point of view. Ballast water must never be loaded into a ballast tank containing hydrocarbon gases in a higher concentration than 20 per cent of the lower explosive limit in such a way that splashing or free fall of water can occur.

1.19 During unloading, the tanks which are served by the pump and piping used for ballast handling should be discharged first. At the point when ballast has to be taken on, the affected piping is first flushed using the procedure in paragraphs 1.14 - 1.16 whereupon the CBT tanks are ballasted to the extent required. Thereafter the ballast handling piping should be kept clean to permit any additional handling of ballast that may be necessary.

1.20 During the ballast voyage the piping is kept clean as a preparation for deballasting. Should any part become contaminated, for instance by its use during tank cleaning of cargo tanks, it is again flushed using ballast water, whereupon the ballast quantity may again be adjusted.

2 **General operational checklists** (section 5 of Manual)

The following checklists apply generally to all CBT tankers. However, when the checklists for a specific tanker are prepared, they should be expanded to include any other steps of relevance and be completed with appropriate identification of pumps, valves, etc.

2.1 *Prior to arrival at the loading port*

No.	Item
(1)	Have all remaining slops been transferred to a cargo tank ?
(2)	If simultaneous discharge of clean ballast while loading is intended, have the pumps and piping designated for clean ballast operation been properly cleaned ?
(3)	Have all valves to the slop tank and the cargo tanks been closed?
(4)	Has a visual inspection of all clean ballast tanks and their contents been made for signs of contamination ?
(5)	Has a sufficient amount of clean ballast water been discharged to ensure that the remaining ballast water and cargo to be loaded will not exceed the permissible deadweight or draught? (A sufficient amount of water should be left for flushing the piping, and as a minimum, a quantity equal to ten times the volume of the affected piping should be left.)
(6)	Have all valves to the clean ballast tanks been closed ?
(7)	If no further ballast discharge is anticipated, has the clean ballast piping been drained ?

2.2 *In the loading port*

No.	Item
(1)	Is sufficient ullage in the slop tank available for the subsequent reception of cargo pump and pipe flushings which will be required after loading cargo ?
(2)	When applicable, has remaining clean ballast been discharged before the entire piping system is used for loading and has the required minimum quantity of flushing water been left in the clean ballast tanks ?
(3)	Have all valves to the clean ballast tanks been closed ?
(4)	Have all valves to the cargo tanks been closed upon completion of loading?

2.3 *Prior to departure from the loading port*

No.	Item
(1)	Have the appropriate pumps and piping been flushed into a slop tank with sufficient water from clean ballast tanks?
(2)	Have valves to the slop tank been closed before pumping the remaining clean water overboard and has the discharge been monitored, either visually or by a content meter?
(3)	Have all valves in the clean ballast tanks been closed?

2.4 *Prior to arrival at the final discharge port*

No.	Item
(1)	Have all valves to the slop tank and the cargo tanks been closed?
(2)	Have the pumps and piping designated for clean ballast operation been properly cleaned?
(3)	Has the required amount of flushing water been taken into the ballast tanks?
(4)	Have all valves in the clean ballast tanks been closed after any necessary ballasting?

2.5 *In the final discharge port*

No.	Item
(1)	Have the necessary pumps and piping intended for clean ballast operation been prepared?
(2)	When draught conditions permit, has ballasting been completed to departure conditions?
(3)	Have all valves to the clean ballast tanks been closed?
(4)	Has unloading of cargo been completed?

2.6 *After departure from the final discharge port*

No.	Item
(1)	Have pumps and piping serving the clean ballast tanks been flushed into the slop tank?
(2)	Have clean ballast tanks been topped up as required?
(3)	Has the slop tank content been processed in accordance with LOT procedures?

Note: Items 2.2(1), 2.3(1) and 2.4(2) do not apply if flushing water is provided overdeck, i.e. by piping other than ships cargo piping.

3 **General guidelines for the carriage of additional ballast** (section 6 of Manual)

3.1 Under certain conditions as provided in Regulation 13(3) of Annex I of MARPOL 73/78 to which paragraphs (7) and (10) of the same Regulation refer, additional ballast may be carried. Before a decision is made to take on additional heavy weather ballast other measures such as reducing speed or altering course should always be considered.

3.2 If additional ballast has to be taken on board this should, if possible, be carried in tanks which have been cleaned for routine sediment control or maintenance. Ballasting of dirty tanks should be avoided. The additional ballast is discharged as dirty ballast in compliance with Regulation 9 of Annex I of MARPOL 73/78 and following the procedure described in section 7 of the Manual. The piping that will subsequently be used for discharging ballast from the dedicated clean ballast tanks may need to be flushed again by drawing some water from these tanks to the slop tank.

3.3 In case the vessel during its ballast voyage sails through special areas no discharge at sea of dirty ballast will be possible in the area.

4 **General guidelines for discharge of dirty ballast and the decanting of slops at sea** (section 7 of Manual)

4.1 *Discharge of dirty ballast*

4.1.1 Discharge of dirty ballast at sea must always be performed under strict control of pumping and in compliance with Regulation 9 of Annex I of MARPOL 73/78. Procedures to ensure that the discharge is restricted to permitted limits should be observed as follows:

.1 Before discharging the dirty ballast overboard, flush main cargo lines to be used for discharging the dirty ballast into the slop tank.

.2 Before flushing, prime the system, establish suction, stop the pump and close all valves and allow the oil to separate out of the pipe walls.

.3 Resume pumping after half an hour at moderate rate with output throttled on the discharge side of the pump.

.4 Commence to discharge dirty ballast.

.5 Reduce discharge rates from individual tanks on approaching a water depth of about 20 per cent of the tank depth.

.6 Thereafter reduce pumping rates to avoid drawing surface oil into the suction by vortex or weir effects. Observe carefully the trend of the oil content monitor reading.

.7 Stop discharge of individual tanks when a level has been reached which, for the particular ship, is known not to give rise to any entrainment of oil. When all dirty ballast tanks have been discharged to this level, all discharge overboard must cease.

.8 The officer in charge must verify that the slop tank can take the volume of dirty ballast remaining. If ullage is insufficient, the slop tank may be partially discharged (see paragraph 4.2 of this section) to provide the necessary capacity taking care to ensure that an adequate depth of water remains beneath the oil residue layer.

.9 Transfer the remaining dirty ballast into the slop tank, using the stripping system.

.10 Transfer to the slop tank the contents of the pump-room bilges and any other bilges connected to the cargo stripping system.

.11 Flush the stripping system, which will then be dirty, into the slop tank.

4.2 *Decanting of slop tanks*

4.2.1 During pipe flushing oil residues will collect in the slop tanks together with water. These residues have to be processed using conventional retention on board techniques. After proper decanting of the water content of the slop tank the residues may remain in the slop tank or may be transferred to a cargo tank and new cargo loaded on top of them or they may be pumped ashore if preferred by the owner/charterer. If cargo is loaded in the slop tanks it is important that there is sufficient ullage to receive the water flushings when the dedicated clean ballast system is cleaned.

4.2.2 Decanting of the contents of the slop tank is a critical step in the retention of oil on board. Hence the timing of the various steps in the operation is important. Even a short delay in stopping a pump or closing a valve can allow oil to escape into the sea. The time required for oil and water to separate in the slop tank depends upon the motion of the ship as well as on the type of previous cargo. Under favourable conditions a few hours may be enough, but in most circumstances 36 hours or more should be allowed. Discharge from the slop tank must cease well before the interface is reached to avoid discharge of any oil-in-water emulsion overboard.

4.2.3 Before starting to decant the contents of the slop tank, an accurate interface and ullage reading, using an oil/water interface detector, must be taken to determine the depth of the oil layer.

4.2.4 Although every effort should be made to remove as much water as possible from the slop tank, the prime objective is to prevent oily water reaching the sea. Extreme care is therefore necessary, and a close check must be kept on the overboard discharge.

4.2.5 Agitation of the contents of the slop tank must be kept to a minimum to avoid drawing oil into the suction by vortex or weir effects, particularly as the oil/water interface approaches the top of the structural members in the tank bottom. Pumping rates must be strictly controlled. The following detailed procedures should be followed:

.1 Cargo lines to be used for decanting slop tanks must be flushed as outlined in paragraphs 4.1.1.1 to 4.1.1.3 of these guidelines.

.2 Pump down the slop tank using one main cargo pump at slow speed until a water depth of about 20 per cent of the tank depth is reached.

.3 Stop the cargo pump, then take an oil/water interface and ullage reading and re-calculate the remaining water depth.

.4 Resume pumping of the slop tank, this time using the stripping system, until a predetermined water depth is reached which, for the particular size and construction of the slop tank, is known not to give rise to discharge of oil. Pumping, which may initially be at a moderate rate, should be slowed as this predetermined water depth is approached.

.5 Observe carefully the trend of the oil content monitor reading.

.6 If oil should appear before the predetermined water depth is reached, stop pumping.

.7 Should this occur, further settling of the slop tank contents should be allowed for as long as possible before repeating the steps given above.

.8 Any decanting beyond this limit must be carried out with extreme care and by strictly observing the oil content monitor reading. When the trend of the monitor reading indicates that the interface is being entrained, the discharge must be stopped immediately.

4.3 *Final line and pump flush*

4.3.1 After these operations have been completed the lines and pumps used will contain traces of oil. The lines and pumps which will be used to discharge ballast must therefore be thoroughly flushed into the slop tank, or while the ship is still more than 50 nautical miles from the nearest land and outside a special area thoroughly flushed to sea, ensuring that the permitted instantaneous rate of discharge of oil and the permitted total quantity of oil discharged are not exceeded.

4.3.2 As a final preparation, pumps that will be used for the discharge of the arrival ballast should take suction from each tank containing arrival ballast for a short period of time.

5 **General guidelines for dealing with oil contamination of the dedicated clean ballast tanks** (section 8 of Manual)

5.1 Oil may enter the dedicated clean ballast tanks through operational or equipment failure. The following additional precautions should therefore be observed:

.1 During the loaded voyage and ballast voyage periodic checks must be made in the ballast tanks for any hydrocarbon gas content and if any gas is detected vent the tank until safe for entry and inspect for leakage in bulkheads and piping.

.2 If oil is detected in ballast water the latter should be considered as dirty ballast and be discharged to reception facilities or at sea during the voyage in compliance with Regulation 9 of Annex I of MARPOL 73/78. After discharging contaminated ballast, washing out clean ballast tanks and flushing of piping, new ballast may be taken in these tanks.

.3 If any oil contamination is found in the dedicated clean ballast tanks the cause should be carefully investigated and the necessary corrective action, whether a repair, a change in the operational procedure or a change in the instructions and training, should be initiated. Any oil contamination in the dedicated clean ballast tanks should be noted in the Oil Record Book together with information about the action taken.

APPENDIX 2

SPECIMEN MANUAL FOR A TANKER OPERATING WITH DEDICATED CLEAN BALLAST TANKS

INTRODUCTION

1 This Manual is written in accordance with the requirements of Regulation 13A of Annex I of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)*.

2 The purpose of the Manual is to meet the requirements for tankers operating with dedicated clean ballast tanks (CBT tankers) in accordance with the revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks (IMCO Assembly resolution A. 495(XII)) and provides standard operational guidance for CBT tankers.

---

* The provision of the revised Specifications for Oil Tankers with Dedicated Clean Ballast Tanks requiring double valve separation between clean ballast tanks and cargo lines not later than 1 July 1983 and proposed amendments to MARPOL 73/78 agreed by the MEPC at its fourteenth session which might affect operational procedures of a CBT tanker have not been considered in this specimen manual.

3 The Manual contains all the information and operational instructions required by the Specifications.*

4 The Manual has been approved by the Administration and no alteration or revision shall be made to any part of it without the prior approval of the Administration.

INDEX (To be inserted)

SECTION 1: TEXT OF THE SPECIFICATIONS

THIS SECTION CONTAINS THE COMPLETE TEXT OF THE REVISED SPECIFICATIONS FOR OIL TANKERS WITH DEDICATED CLEAN BALLAST TANKS

(Revised Specifications to be inserted)

SECTION 2: DRAWINGS OF THE DEDICATED CLEAN BALLAST TANK SYSTEMS

THIS SECTION CONTAINS LINE DRAWING(S) OF SYSTEMS CONNECTED TO THE DEDICATED CLEAN BALLAST TANKS SHOWING:

(1) TANK ARRANGEMENTS;

(2) CARGO PUMP(S), LINES AND VALVES;

(3) BALLAST SYSTEMS (WHERE FITTED);

(4) STRIPPING SYSTEMS;

(5) DECK SERVICE LINES USED FOR SUPPLYING FLUSH WATER (WHERE APPLICABLE);

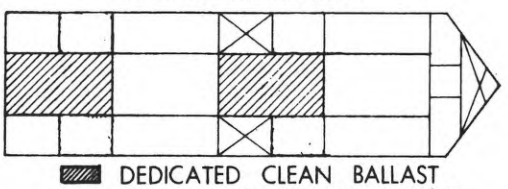
(6) SAMPLING POINTS FOR OIL CONTENT METER.

---

* This specimen Manual covers only the information required by the Specifications; it therefore consists of one part only as explained in the footnote to the standard text of the introduction in the standard format for the Dedicated Clean Ballast Tank Operation Manual.

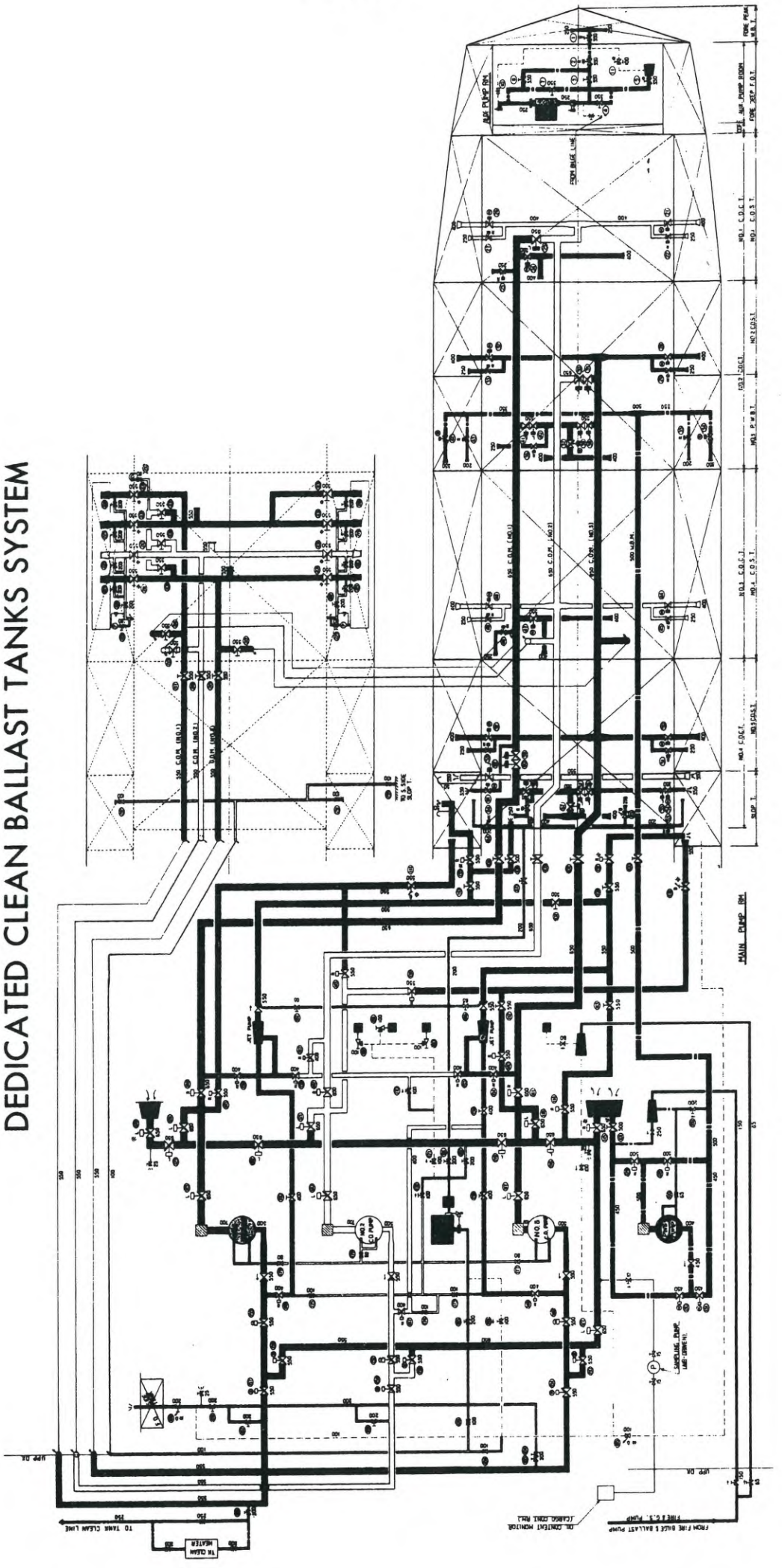
SYMBOLS	
	BUTTERFLY VALVE (MANUAL OPERATED)
Ð	BUTTERFLY VALVE (MANUAL SPINDLE OPERATED FROM UPP. DK.)
L	BUTTERFLY VALVE (HYDRAULIC VALVE SIDE OPERATED)
L	BUTTERFLY VALVE (HYDRAULIC LOCAL OPERATED FROM UPP. DK.)
R	BUTTERFLY VALVE (HYDRAULIC REMOTE OPERATED WITH OPEN/SHUT INDICATOR OF I.S. DIRECT COUPLING)
R	BUTTERFLY VALVE (HYDRAULIC REMOTE OPERATED WITH OPEN/SHUT INDICATOR OF I.S. FLOW METER)
Ⓡ	BUTTERFLY VALVE (HYDRAULIC REMOTE OPERATED WITH POSITION INDICATOR OF I.S. DIRECT COUPLING)
Ⓡ	BUTTERFLY VALVE (HYDRAULIC REMOTE OPERATED WITH POSITION INDICATOR OF I.S. FLOW METER)
	BUTTERFLY VALVE (HYDRAULIC REMOTE OPERATED WITH AUTO FLOW CONTROL FOR J.S.S.)
	SLUICE VALVE (MANUAL OPERATED)
Ð	SLUICE VALVE (MANUAL SPINDLE OPERATED FROM UPP. DK.)
	GLOBE VALVE (MANUAL OPERATED)
	CHECK VALVE
	CHECK ANGLE VALVE
	SCREW-DOWN NON-RETURN VALVE (MANUAL OPERATED)
Ð	SCREW-DOWN NON-RETURN VALVE (MANUAL SPINDLE OPERATED FROM UPP. DK.)
	RELIEF VALVE
	BELLMOUTH
	ROSE BOX
	STRAINER
	REDUCER
	SEA CHEST
	SPECTACLE FLANGE
	CAST STEEL VALVE
	CROSSING PIPES NOT CONNECTED
	CROSSING PIPES CONNECTED
	PIPING GOING UPWARDS
	PIPING GOING DOWNWARDS

CARGO OIL TANK GROUP



DEDICATED CLEAN BALLAST
PERMANENT WATER BALLAST

DEDICATED CLEAN BALLAST TANKS SYSTEM



SECTION 3: DESCRIPTION OF THE SYSTEMS CONNECTED TO THE DEDICATED CLEAN BALLAST TANKS

THIS SECTION CONTAINS A DESCRIPTION OF THE PUMPING AND PIPING SYSTEMS, INCLUDING VALVE LOCATIONS FOR THE CARGO, BALLAST, STRIPPING AND SLOP TANK ARRANGEMENTS, ASSOCIATED WITH THE OPERATIONAL REQUIREMENTS OF THE DEDICATED CLEAN BALLAST TANKS.

3.1 *Cargo system*

3.1.1 There are four centre and six pairs of wing tanks. The dedicated clean ballast is to be carried in No. 2 centre and No. 4 centre and permanent ballast in No. 3 wings. No. 8 wings are the slop tanks.

3.1.2 Cargo is handled by three main cargo oil pumps each connected to its own suction and discharge main. No. 1 pump is used to discharge the port slop and centre tanks, No. 2 pump to discharge No. 1 and No. 4 wing tanks and No. 3 pump to discharge the starboard slop and No. 2 and No. 5 wing tanks. All three pumps are suitably interconnected by cross-overs both on the suction and discharge piping.

3.2 *Stripping system*

3.2.1 There is no separate stripping system for the cargo tanks. A jet strip system is used for stripping through an auxiliary stripping suction, taken off the main suction branch.

3.2.2 The jet strip system consists of two eductors connected to No. 1 and No. 3 cargo oil suction mains with a cross-connexion to No. 2 suction main. The eductors discharge to the slop tank or No. 4 centre tank.

3.2.3 A reciprocating stripping pump is provided with direct suction to each slop tank, No. 4 centre tank and the suction cross-connexion to the cargo oil pumps. The stripping pump discharges to the starboard slop tank, outboard of the manifold valves, and to each cargo discharge main.

3.3 *Permanent ballast system*

3.3.1 Permanent ballast is carried in No. 3 wings and is handled by a separate system with its own pumping and piping installation.

3.4 *Dedicated clean ballast system*

3.4.1 No. 2 and No. 4 centre tanks are designated as the dedicated clean ballast tanks. The ballasting and discharging of these tanks will be accomplished with No. 1 cargo oil pump.

3.4.2 The ballasting will be achieved using the port side sea suction through No. 1 discharge main over the deck and through the direct filling drop into No. 1 suction main. Simultaneous ballasting and discharging of cargo from the wing tanks is not permissible.

3.4.3 The discharge of ballast will be achieved using No. 1 suction main and discharging through the cross-over in the pump-room into the starboard side sea suction. Simultaneous operation of discharging ballast and loading cargo is not permissible.

3.5 *Restriction on operations*

3.5.1 Due to the limitation of the systems the following restrictions on the operations will apply:

.1 The CBT ballast must be discharged before the loading of cargo.

.2 The discharge of cargo is to be completed before the loading of CBT ballast.

.3 Permanent ballast in No. 3 wings may be loaded or discharged at any time.

SECTION 4: DEDICATED CLEAN BALLAST TANK OPERATION PROCEDURES

THIS SECTION CONTAINS SPECIFIC OPERATIONAL PROCEDURES FOR VALVE OPERATIONS, LINE CLEANING AND FOR LOADING AND DISCHARGING CLEAN BALLAST WHEN CONDUCTED:

(1) PRIOR TO ARRIVAL AND AT THE LOADING PORT;

(2) PRIOR TO DEPARTURE FROM THE LOADING PORT;

(3) PRIOR TO ARRIVAL AT THE FINAL DISCHARGE PORT;

(4) IN THE FINAL DISCHARGE PORT;

(5) AFTER DEPARTURE FROM THE FINAL DISCHARGE PORT.

ANY ADDITIONAL PROCEDURE USED FOR THE OPERATION OF THE DEDICATED CLEAN BALLAST TANKS SHALL BE SPECIFIED. THIS SECTION ALSO CONTAINS RELEVANT DATA ON SAFE TRIM AND STRESS LEVELS FOR THE SHIP.

Note: Dedicated clean ballast operations require a full appreciation of the operational procedures and a thorough understanding of what is going on at all times. Frequent checks are essential to ensure that contamination or pollution does not occur.

The loading/discharge and ballast handling programme together with the checklist (see section 5) and any other relevant information should be displayed in the cargo control room or other appropriate place accessible to all persons concerned.

In the loading port, all the CBT ballast should be discharged before loading cargo and in final port of discharge, cargo should be completely discharged before ballast is taken aboard.

4.1 *Prior to arrival at the loading port*

4.1.1 After completion of line flushing procedure and prior to arrival at the loading port the valves on the slop tanks, cargo tanks and dedicated clean ballast tanks are to be closed. The identification numbers of these valves are:

Slop tanks	– port	61, 64, 133, 111
	– starboard	54, 63, 108, 132
Cargo tanks – all tank valves		
Dedicated clean ballast tanks	– No. 2 (36, 37)	
	– No. 4 (58, 67)	

4.1.2 Immediately before discharge of ballast an inspection is to be made of the surface of the CBT ballast to ensure there has been no oil contamination.

4.1.3 In the loading port and prior to loading cargo the CBT ballast is to be discharged, by No. 1 cargo oil pump and its associated piping, overboard through the starboard sea suction valve. The oil content meter must be calibrated and the system be ready to monitor the ballast discharge. During discharge, if there is any doubt on the cleanliness of the water, the discharge must be stopped and the remainder retained in the ballast tank. The valves to be opened for ballast discharge are:

Suction main	– 40, 41, 59, 60, 104, 144, 123
Discharge main	– 155, 156, 127, 115
Dedicated clean ballast tanks	– No. 2 (36, 37)
	– No. 4 (58, 67)
Sea suction	– 115

4.1.4 Discharge from No. 2 centre tank should be stopped when the tank innage is a half metre; this enables the branch pipes to be flushed when the lines are being cleaned.

4.1.5 Discharge from No. 4 centre tank should be stopped when the tank innage is one and a half metres – see paragraph 5.1.3, section 1 of this Manual.

4.1.6 To utilize the system for cargo loading, drain the piping into the port slop tank. After draining close all valves.

4.2 *Prior to departure from the loading port*

4.2.1 Prior to departure from the loading port it should be ensured that:

.1 all cargo lines are stripped and drained as far as possible;

.2 all slop tank and cargo tank valves are closed.

4.3 *Prior to arrival at the final discharge port*

4.3.1 During the loaded voyage periodic checks must be made in the ballast tanks for any hydrocarbon content and if any gas is detected vent the tank until safe for entry and inspect for leakage in bulkheads and piping.

4.4 *In the final discharge port*

4.4.1 After discharge of cargo it should be ensured that:

.1 all cargo lines are stripped and drained as far as possible;

.2 all slop tanks and cargo tank valves are closed.

4.4.2 After cargo discharge the dedicated clean ballast system must be flushed with water from No. 4 centre tank. Using No. 1 cargo pump, flush its associated piping and No. 2 cargo suction main. Circulate water round the system and return the flushings to the port slop tank via No. 2 cargo suction main. Flushing should be continued for at least thirty minutes. Under no circumstances must flushings be returned to a dedicated clean ballast tank. The valves to be opened for flushing are:

Suction main	– No. 1 40, 41, 59, 60, 104, 144, 123
	– No. 2 25, 105, 142, 143, 111
Dedicated clean ballast tanks	– No. 2 (36, 37)
	– No. 4 (58, 67)
Cargo discharge main	– 156, 157, 217
Drop pipe	– 214

4.4.3 Before flushing, prime the system, establish suction, stop the pump and close all valves to allow oil to separate out from the pipe walls. After about half an hour, resume pumping at a moderate rate with the output throttled on the discharge side of the pump.

4.4.4 After priming the system the branch suction pipe on No. 2 centre tank is to be cleaned using No. 1 cargo pump and its suction main and discharging via the port jet pump into the port slop tank. Continue this operation for three minutes, stop pump, close all valves and proceed to flush system as previously described. The valves to be opened for flushing branch pipes are:

Suction main	– No. 1 40, 41, 59, 60, 104, 144, 123
No. 2 centre tank	– 36, 37
Cargo discharge main	– 155
Discharge to jet pump	– 148, 160, 110, 155

4.4.5 Before ballasting the tanks check for hydrocarbon content as outlined in paragraph 4.3.1 of this section.

4.4.6 The tanks are ballasted using No. 1 cargo oil pump and its associated piping. The ballast suction is taken from the port sea suction and discharges over the deck to each respective tank via the suction main. The valves to be opened for ballasting are:

Suction main	– 40, 41, 59, 60, 104, 144, 123
Sea suction	– 126, 125, 124
Discharge main	– 155, 157
Drop pipe	– 124
Dedicated clean ballast tanks	– No. 2 (36, 37)
	– No. 4 (58, 67)

4.4.7 When ballast tanks are full, stop the pump, drain the system to the port slop tank and close all valves.

4.5 *After departure from the final discharge port*

4.5.1 During the ballast voyage the slop tank contents must be processed in accordance with section 7 of this Manual.

4.5.2 During the ballast voyage a visual inspection of the surface of the CBT ballast is to be made at regular intervals to ensure there is no oil contamination.

SECTION 5: CHECKLISTS FOR BALLASTING AND DEBALLASTING DEDICATED CLEAN BALLAST TANKS

THIS SECTION CONTAINS OPERATIONAL CHECKLISTS FOR THE USE OF THE CREW IN BALLASTING AND DEBALLASTING OPERATIONS WHICH SHALL INCLUDE THE CHECKING AND CALIBRATION OF OIL CONTENT METERS.

5.1 *Prior to arrival at the loading port*

.1 Have the pumps and piping designated for clean ballast operation been properly cleaned?

.2 Have all valves on the slop tanks, cargo tanks and dedicated clean ballast tanks been closed?

.3 Has a visual inspection of all clean ballast tanks and their contents been made for signs of contamination?

5.2 *In the loading port*

.1 Has the oil content meter been calibrated?

.2 Has sufficient water been left in No. 2 and No. 4 centre tanks on completion of ballast discharge?

.3 Has the clean ballast piping been drained?

.4 Have all valves on the dedicated clean ballast system been closed?

.5 Is sufficient ullage in the slop tank available for the subsequent reception of cargo pump and pipe flushings?

5.3 *After departure from the loading port*

.1 Have all cargo lines been stripped and drained?

.2 Have the slop tanks and all cargo valves been closed?

5.4 *Prior to arrival at the final discharge port*

.1 Have checks been made in the ballast tanks for hydrocarbon content?

5.5 *In the final discharge port*

.1 Have all cargo lines been stripped and drained on completion of cargo discharge?

.2 Have slop tanks and all cargo tank valves been closed?

.3 Have the appropriate pumps and piping been flushed into the port slop tank?

.4 Have No. 2 and No. 4 centre tanks been ballasted on completion of flushing?

.5 Have the ballast tanks been checked for hydrocarbon content prior to ballasting?

.6 Have all the valves on the dedicated clean ballast system been closed?

5.6 *After departure from the final discharge port*

.1 Have the slop tank contents been processed in accordance with load-on-top procedures?

.2 Are regular inspections being made of the dedicated clean ballast tanks to ensure there is no contamination of the ballast water?

SECTION 6: CARRIAGE OF ADDITIONAL BALLAST

THIS SECTION CONTAINS INFORMATION AND PROCEDURES FOR THE CARRIAGE OF ADDITIONAL BALLAST PERMITTED BY PROVISIONS OF REGULATION 13(3) OF ANNEX I OF MARPOL 73/78.

6.1 Under certain conditions as provided in Regulation 13(3) of Annex I of MARPOL 73/78, to which paragraphs (7) and (10) of the same Regulation refer, additional ballast may be carried. Before a decision is made to take on additional heavy weather ballast other measures such as reducing speed or altering course should always be considered.

6.2 If additional ballast has to be taken on board this should, if possible, be carried in tanks which have been cleaned for routine sediment control or maintenance. Ballasting of dirty tanks should be avoided. The additional ballast is discharged as dirty ballast in compliance with Regulation 9 of Annex I of MARPOL 73/78 and following the procedure described in Section 7 of the Manual. The piping that will subsequently be used for discharging ballast from the dedicated clean ballast tanks may need to be flushed again by drawing some water from these tanks to the slop tank.

6.3 In case the tanker during its ballast voyage sails through special areas no discharge of dirty ballast at sea will be possible in the area.

SECTION 7: COMPLIANCE PROCEDURES FOR REGULATION 9 OF ANNEX I OF MARPOL 73/78

THIS SECTION CONTAINS INFORMATION AND PROCEDURES FOR THE DISCHARGE OF DIRTY BALLAST AND THE DECANTING OF SLOPS AT SEA TO ENSURE COMPLIANCE WITH REGULATION 9 OF ANNEX I OF MARPOL 73/78.

7.1 *Discharge of dirty ballast*

7.1.1 Discharge of dirty ballast at sea must always be performed under strict control of pumping and in compliance with Regulation 9 of Annex I of MARPOL 73/78. Procedures to ensure that the discharge is restricted to permitted limits should be observed as follows:

.1 Before discharging the dirty ballast overboard flush main cargo lines to be used for discharging the dirty ballast into the slop tank.

.2 Before flushing, prime the system, establish suction, stop the pump and close all valves and allow the oil from the pipe walls to separate out.

.3 Resume pumping after half an hour at moderate rate with output throttled on the discharge side of the pump.

.4 Commence to discharge dirty ballast.

.5 Reduce discharge rates from individual tanks on approaching a water depth of about 20 per cent of the tank depth.

.6 Thereafter reduce pumping rates to avoid drawing surface oil into the suction by vortex or weir effects. Observe carefully the trend of the oil content monitor reading.

.7 Stop discharge of individual tanks when a level has been reached which is known not to give rise to any entrainment of oil. When all dirty ballast tanks have been discharged to this level, all discharge overboard must cease.

.8 The officer in charge must verify that the slop tank can take the volume of dirty ballast remaining. If ullage is insufficient, the slop tank may be partially discharged (see paragraph 7.2 of this section), to provide the necessary capacity taking care to ensure that an adequate depth of water remains beneath the oil residue layer.

.9 Transfer the remaining dirty ballast into the slop tank, using the stripping system.

.10 Transfer to the slop tank the contents of the pump-room bilges and any other bilges connected to the cargo stripping system.

.11 Flush the stripping system, which will then be dirty, into the slop tank.

7.2 *Decanting of slop tanks*

7.2.1 During pipe flushing oil residues will collect in the slop tanks together with water. These residues have to be processed using conventional retention on board techniques. After proper decanting of the slop tank and water content the residues may remain in the slop tank or may be transferred to a cargo tank and new cargo loaded on top of them or they may be pumped ashore if preferred by the owner/charterer. If cargo is loaded in the slop tanks it is important that there is sufficient ullage to receive the water flushings when the dedicated clean ballast system is cleaned.

7.2.2 Decanting of the contents of the slop tank is a critical step in the retention of oil on board. Hence the timing of the various steps in the operation is important. Even a short delay in stopping a pump or closing a valve can allow oil to escape into the sea. The time required for oil and water to separate in the slop tank depends upon the motion of the ship as well as on the type of previous cargo. Under favourable conditions a few hours may be enough, but in most circumstances 36 hours or more should be allowed. Discharge from the slop tank must cease well before the interface is reached to avoid discharge of any oil-in-water emulsion overboard.

7.2.3 Before starting to decant the contents of the slop tank, an accurate interface and ullage reading, using an oil/water interface detector, must be taken to determine the depth of the oil layer.

7.2.4 Although every effort should be made to remove as much water as possible from the slop tank, the prime objective is to prevent oily water reaching the sea. Extreme care is therefore necessary, and a close check must be kept on the overboard discharge.

7.2.5 Agitation of the contents of the slop tank must be kept to a minimum to avoid drawing oil into the suction by vortex or weir effects, particularly as the oil/water interface approaches the top of the structural members in the tank bottom. Pumping rates must be strictly controlled. The following detailed procedures should be followed:

.1 Cargo lines to be used for decanting slop tanks must be flushed as outlined in paragraphs 7.1.1.1 to 7.1.1.3 of this section.

.2 Pump down the slop tank using one main cargo pump at slow speed until a water depth of about 20 per cent of the tank depth is reached.

.3 Stop the cargo pump, then take an oil/water interface and ullage reading and re-calculate the remaining water depth.

.4 Resume pumping of the slop tank, this time using the stripping system, until a predetermined water depth is reached which, for the particular size and construction of the slop tank, is known not to give rise to discharge of oil. Pumping, which may initially be at a moderate rate, should be slowed as this predetermined water depth is approached.

.5 Observe carefully the trend of the oil content monitor reading.

.6 If oil should appear before the predetermined water depth is reached, stop pumping.

.7 Should this occur, further settling of the slop tank contents should be allowed for as long as possible before repeating the steps given above.

.8 Any decanting beyond this limit must be carried out with extreme care and by strictly observing the oil content monitor reading. When the trend of the monitor reading indicates that the interface is being entrained, the discharge must be stopped immediately.

7.3 *Final line and pump flush*

7.3.1 After these operations have been completed the lines and pumps used will contain traces of oil. The lines and pumps which will be used to discharge CBT ballast must therefore be thoroughly flushed into the slop tank, or while the ship is still more than 50 nautical miles from the nearest land and outside a special area thoroughly flushed to sea ensuring that the permitted instantaneous rate of discharge of oil and the permitted total quantity of oil discharged are not exceeded.

7.3.2 As a final preparation, pumps that will be used for the discharge of the arrival ballast should take suction from each tank containing arrival ballast for a short period of time.

SECTION 8: ADDITIONAL PRECAUTIONS AGAINST OIL POLLUTION

THIS SECTION CONTAINS INFORMATION AND PROCEDURES FOR DEALING WITH OIL CONTAMINATION OF THE DEDICATED CLEAN BALLAST TANKS

8.1 Oil may enter the dedicated clean ballast tanks through operational or equipment failure. The following additional precautions should therefore be observed:

.1 During the loaded voyage and ballast voyage periodic checks must be made in the ballast tanks for any hydrocarbon gas content; if any gas is detected vent the tank until safe for entry and inspect for leakage in bulkheads and piping.

.2 If oil is detected in ballast water the latter should be considered as dirty ballast and be discharged to reception facilities or at sea during the voyage in compliance with Regulation 9 of Annex 1 of MARPOL 73/78. After discharge of contaminated ballast, washing out of clean ballast tanks and flushing of piping, new ballast may be taken in these tanks.

.3 If any oil contamination is found in the dedicated clean ballast tanks the cause should be carefully investigated and the necessary corrective action, whether a repair, a change in the operational procedure or a change in the instructions and training, should be initiated. Any oil contamination in the dedicated clean ballast tanks should be noted in the Oil Record Book together with information about the actions taken.

SECTION 9: PROCEDURES FOR CHANGING FROM PRODUCT TRADE TO CRUDE OIL TRADE*

THIS SECTION CONTAINS OPERATIONAL PROCEDURES FOR CHANGING FROM PRODUCT TRADE TO CRUDE OIL TRADE FOR A TANKER WHICH IS FITTED WITH SEPARATE INDEPENDENT PUMPING AND PIPING ARRANGEMENTS FOR BALLASTING DEDICATED CLEAN BALLAST TANKS AND WITH A CRUDE OIL WASHING SYSTEM AND WHICH HAS BEEN ISSUED WITH TWO IOPP CERTIFICATES RUNNING CONCURRENTLY WITH ONE CERTIFICATE CERTIFYING THE TANKER TO BE A CRUDE OIL TANKER AND THE OTHER CERTIFYING IT TO BE A PRODUCT CARRIER.

9.1 An existing oil tanker operating with dedicated clean ballast tanks in the product trade, that is also equipped with both a COW system for the crude oil trade and separate independent pump and piping arrangements for ballasting the dedicated clean ballast tanks, may change from the product trade to the crude oil trade without undergoing a survey. When making this change from the product trade operating with dedicated clean ballast tanks to the crude oil trade operating with a COW system, the following procedures shall be followed:

.1 After discharge of the product cargo, the dedicated clean ballast tanks should be ballasted through the separate independent pump and piping arrangements in accordance with the procedures contained in section 4 of this Manual.

.2 During the ballast voyage, a visual inspection of the surface of the CBT ballast is to be made at regular intervals to ensure there is no oil contamination.

.3 When arriving at the loading port, CBT ballast should be discharged through the separate independent pump and piping arrangements in accordance with the procedures contained in section 4 of this Manual. If there is an indication that the CBT ballast has been contaminated with oil, all discharges from the tank should be made through the cargo piping connexion to the tank, and not the separate independent ballast piping.

.4 After CBT ballast has been discharged and prior to loading the crude oil cargo, all the valves in the separate independent piping system for ballasting the dedicated clean ballast tanks should be closed and secured.

.5 Crude oil cargo can then be loaded in all the tanks, including those that have been designated as dedicated clean ballast tanks when the vessel is operating in the product trade.

.6 The vessel should now operate as a crude oil tanker equipped with a COW system and the COW Operations and Equipment Manual should be used while the vessel is operating in this trade.

---

* This specimen Manual, which was prepared on a basis of a particular tanker, did not originally include a section 9, since the tanker is not fitted with separate and independent ballasting arrangements for dedicated clean ballast tanks. This section has been added as an example of how the information might be presented if required in a particular case.