Resolution A.862(20)

adopted on 27 November 1997

Code of Practice for the Safe Loading and Unloading of Bulk Carriers

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to regulations and guidelines concerning maritime safety,

RECALLING FURTHER that, by resolutions A.713(17) and A.797(19), it adopted measures to improve the safety of ships carrying solid bulk cargoes,

RECALLING ALSO that, in adopting resolution A.797(19), it requested the Maritime Safety Committee (MSC) to carry out, with high priority, its work on the safety of ships carrying solid bulk cargoes and to develop, as soon as possible, requirements and recommendations covering survivability standards, design and construction standards, management and training, operational standards, survey requirements and ship/shore interface aspects,

NOTING that, by resolution MSC.47(66), the MSC, at its sixty-sixth session, adopted amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974, to include a revised regulation 7 of chapter VI dealing with loading and unloading of bulk cargo,

NOTING FURTHER the approval by the MSC, at its sixty-sixth session, of MSC/Circ.743 on communications between maritime administrations and port authorities, whereby Governments in whose territories solid bulk cargo loading and unloading terminals are situated are invited to introduce port by-laws complying with operative paragraph 5 of that circular,

BEING CONCERNED at the continued loss of ships carrying solid bulk cargoes, sometimes without a trace, and the heavy loss of life incurred,

BEARING IN MIND that a number of accidents have occurred as a result of improper loading and unloading of bulk carriers and that the development of safe loading and unloading practices can prevent such accidents occurring in the future,

RECOGNIZING the need to improve the safe loading and unloading of bulk carriers,

RECOGNIZING FURTHER that such improvement could be achieved by the establishment of a composite code of practice for the safe loading and unloading of bulk carriers,

BELIEVING that the application of such a code of safe practice would enhance maritime safety,

HAVING CONSIDERED the recommendation made by the MSC at its sixty-sixth and sixty-eighth sessions,

1. ADOPTS the Code of Practice for the Safe Loading and Unloading of Bulk Carriers, set out in the annex to the present resolution;

2. URGES Governments to implement this Code at the earliest possible opportunity and to inform IMO of any non-compliance;

3. FURTHER URGES Governments in whose territories solid bulk cargo loading and unloading terminals are situated, to introduce port by-laws to the effect that:

.1 terminal operators are required to comply with the relevant IMO codes and recommendations on ship/port co-operation;

.2 terminal operators are required to appoint a "terminal representative" as stipulated in section 1.6 of the annex to resolution A.797(19);

.3 the master is responsible at all times for the safe loading and unloading of the ship, the details of which should be confirmed with the terminal operator in the form of an agreed loading or unloading plan;

.4 in case of non-compliance with the agreed loading or unloading plans or any other situation which endangers the safety of the ship, the master has the right to stop the loading or unloading; and

.5 port authorities have the right to stop the loading or unloading of solid bulk cargoes when the safety of the ship carrying such cargoes is endangered.

4. REQUESTS the MSC to keep this Code under review and to amend it, as necessary;

5. REVOKES MSC/Circ.690 and DSC/Circ.3.

Code of Practice for the Safe Loading and Unloading of Bulk Carriers

Introduction

1 This Code of Practice for the Safe Loading and Unloading of Bulk Carriers* has been developed by the International Maritime Organization to minimize losses of bulk carriers.

2 The purpose of the Code is to assist persons responsible for the safe loading or unloading of bulk carriers to carry out their functions and to promote the safety of bulk carriers.

3 The Code primarily covers the safety of ships loading and unloading solid bulk cargoes and reflects current issues, best practices and legislative requirements. Broader safety and pollution issues such as those covered by the SOLAS, MARPOL and Load Line Conventions are not specifically included in the Code.

4 The recommendations in this Code provide guidance to shipowners, masters, shippers, operators of bulk carriers, charterers and terminal operators for the safe handling, loading, and unloading of solid bulk cargoes. The recommendations are subject to terminal and port requirements, or national regulations. Persons responsible for the loading or unloading of bulk carriers should also be aware of such regulations and requirements.

5 Masters and terminals loading and unloading solid bulk cargoes possessing chemical hazards should also refer to SOLAS chapters II-2 and VII and to MSC/Circ.675 (Recommendations on the safe transport of dangerous cargoes and related activities in port areas).

6 The requirements of individual terminals and port authorities should be published in terminal and port information books. The type of information usually given in these books is listed in appendix 1. The books

* The Code of Safe Practice for the Safe Loading and Unloading of Bulk Carriers comprises the annex to resolution A.862(20), the text of which is given on page 3.

should be given to the masters of ships where possible before or on arrival at a port or terminal.

7 It is recommended that a copy of this Code be made available to every ship, charterer and bulk loading or unloading terminal so that advice on operational procedures is readily available and respective responsibilities are identified.

8 In the event of a conflict between this Code and the International Code for the Safe Carriage of Grain in Bulk (International Grain Code), the provisions of the International Grain Code should prevail.

Section 1
Definitions

For the purpose of the Code the following definitions apply:

1.1 *Air draught* means the vertical distance from the surface of the water to the highest point of mast or aerial.

1.2 *Bulk Cargo Shipping Name (BCSN)* identifies a bulk cargo during transport by sea. When a cargo is listed in the IMSBC Code, the Bulk Cargo Shipping Name of the cargo is identified by capital letters in the individual schedules or in the index. When the cargo is a dangerous good, as defined in the International Maritime Dangerous Goods (IMDG) Code, as defined in regulation VII/1.1 of the SOLAS Convention, the Proper Shipping Name of that cargo is the Bulk Cargo Shipping Name.

1.3 *Combination carriers (OBO* or *O/O)* means a ship whose design is similar to a conventional bulk carrier but is equipped with pipelines, pumps and inert gas plant so as to enable the carriage of oil cargoes in designated spaces.

1.4 *Conveyor system* means the entire system for delivering cargo from the shore stockpile or receiving point to the ship.

1.5 *Hot work* means the use of open fires and flames, power tools or hot rivets, grinding, soldering, burning, cutting, welding or any other repair work involving heat or creating sparks which may lead to a hazard because of the presence or proximity of flammable atmosphere.

1.6 *IMSBC Code* means the International Maritime Solid Bulk Cargoes Code as defined in regulation VI/1.1 of the SOLAS Convention.

1.7 *List indication lights* means lights, visible from the deck, which light up to show that a ship is listing.

1.8 *Master* means the master of the ship or a ship's officer designated by the master.

1.9 *Pour* means the quantity of cargo poured through one hatch opening as one step in the loading plan, i.e., from the time the spout is positioned over a hatch opening until it is moved to another hatch opening.

1.10 *Solid bulk cargo* means any cargo, other than a liquid or a gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition which is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

1.11 *Terminal representative* means a person appointed by the terminal or other facility where the ship is loading or unloading, who has responsibility for operations conducted by that terminal or facility with regard to the particular ship.

1.12 *Trimming* (loading cargo) is the partial or total levelling of the cargo within the holds, by means of loading spouts or chutes, portable machinery, equipment or manual labour.

1.13 *Trimming* (unloading cargo) is the shovelling or sweeping up of smaller quantities of the cargo in the holds by mechanical means (such as bulldozers) or other means to place them in a convenient position for discharge.

1.14 *Trimming* (ship) is the adding, removal or shifting of weight in a ship to achieve the required forward and aft draughts.

Section 2
Suitability of ships and terminals

2.1 General

2.1.1 All ships nominated for loading should hold the appropriate valid statutory certification including, if required, the document of compliance* for ships carrying solid dangerous goods in bulk. It is recommended that the period of validity of the ship's certificates be sufficient to remain valid during

* Applicable to ships constructed on or after 1 September 1984.

loading, voyage and unloading times, plus a reserve to allow for delays in berthing, inclement weather or both.

2.1.2 The shipowner, manager or operator, when offering a ship for a particular cargo or service, should ensure that the ship:

.1 is maintained in a sound, seaworthy condition;

.2 has on board a competent crew;

.3 has on board at least one officer proficient in the languages used at both the loading and unloading ports, or has an officer available who is proficient in the English language; and

.4 is free of defects that may prejudice the ship's safe navigation, loading or unloading.

2.1.3 It is essential that a ship selected to transport a solid bulk cargo be suitable for its intended purpose taking into account the terminals at which it will load or unload.

2.1.4 The charterer and shipper when accepting a ship for a particular cargo or service should ensure that the ship:

.1 is suitable for access to the planned loading or unloading facilities; and

.2 does not have cargo handling equipment which would inhibit the safety of the loading and unloading operations.

2.2 Ships

2.2.1 Ships nominated for bulk loading should be suitable for the intended cargo. Suitable ships should be:

.1 weathertight, and efficient in all respects for the normal perils of the sea and the intended voyage;

.2 provided with an approved stability and loading booklet written in a language understood by the ship's officers concerned and using standard expressions and abbreviations. If the language is neither English, nor French, nor Spanish, a translation into one of these languages should be included;

.3 provided with hatch openings of sufficient size to enable the cargo to be loaded, stowed and unloaded satisfactorily; and

.4 provided with the hatch identification numbers used in the loading manual and loading or unloading plan. The location, size and colour of these numbers should be chosen so that they are clearly visible to the operator of the loading or unloading equipment.

2.2.2 It is recommended that all ships which are required to carry out stress calculations should have on board an approved loading instrument for the rapid calculation of such stresses.

2.2.3 All propulsion and auxiliary machinery should be in good functional order. Deck equipment related to mooring and berthing operations, including anchors, cables, mooring lines, hawsers and winches, should be operable and in good order and condition.

2.2.4 All hatches, hatch operating systems and safety devices should be in good functional order, and used only for their intended purpose.

2.2.5 List indication lights, if fitted, should be tested prior to loading or unloading and proved operational.

2.2.6 Ship's own cargo handling equipment should be properly certificated and maintained, and used only under the general supervision of suitably qualified ship's personnel.

2.3 Terminals

2.3.1 Terminal operators should ensure that they only accept ships that can safely berth alongside their installation, taking into consideration issues such as:

.1 water depth at the berth;

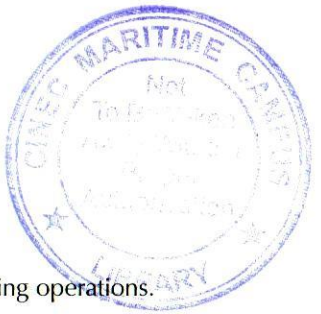
.2 maximum size of the ship;

.3 mooring arrangements;

.4 fendering;

.5 safe access; and

.6 obstructions to loading/unloading operations.



2.3.2 Terminal equipment should be properly certificated and maintained in accordance with the relevant national regulations and/or standards, and only operated by duly qualified and, if appropriate, certificated personnel.

2.3.2.1 Where automatic weighing equipment is provided, this should be calibrated at regular intervals.

2.3.3 Terminal personnel should be trained in all aspects of safe loading and unloading of bulk carriers, commensurate with their responsibilities.

2.3.3.1 The training should be designed to provide familiarity with the general hazards of loading, unloading and carriage of bulk cargoes and the adverse effect improper cargo handling operations may have on the safety of the ship.

2.3.4 Terminal operators should ensure that personnel involved in the loading and unloading operations are duly rested to avoid fatigue.

Section 3
Procedures between ship and shore prior to the ship's arrival

3.1 Information exchange: general

3.1.1 It is important that the ship be provided with information about a terminal so the loading or unloading can be planned. Similarly, the terminal will need information about the ship to enable preparations to be made to load or unload the ship. It is important that the information be exchanged in sufficient time to allow preparations to be made.

3.1.2 Before loading commences there should be an agreement between the master and the terminal representative as to the rate of loading and order in which the cargo is to be distributed so as to achieve the final loading plan. In general, this agreement should be based on one or more of the following options:

.1 the limitations or restrictions on loading procedures, if such are specified in the ship's loading manual or trim and stability booklet, or both;

.2 if the restrictions mentioned in .1 do not exist, and the ship has a loading instrument which has been approved, the loading plan should be prepared on the instrument and there should be a protocol in place so that the loading remains, at all times, within the approved stress limits of the ship; and/or

.3 if neither .1 or .2 can be satisfied, then a conservative procedure should be followed.

3.1.3 Details should be provided of any necessary repairs which may delay berthing, the commencement of loading or unloading, or may delay the ship sailing on completion of loading or unloading.

3.1.4 The master should ensure he receives from the shipper of the intended cargo details of the nature of the cargo required by chapter VI of SOLAS 1974, as amended.* Where additional details, such as trimming or continuous measurement of the water in the cargo, etc., are required, the master should inform the terminal accordingly.

3.2 Information given by the ship to the terminal

3.2.1 In order to plan the proper disposition and availability of the cargo so as to meet the ship's loading plan, the loading terminal should be given the following information:

.1 The ship's estimated time of arrival (ETA) off the port as early as possible. This advice should be updated as appropriate.

.2 At the time of initial ETA advice, the ship should also provide details of the following:

.2.1 name, call sign, IMO Number of the ship, its flag State and port of registry;

.2.2 a loading plan stating the quantity of cargo required, stowage by hatches, loading order and the quantity to be loaded in each pour, provided the ship has sufficient information to be able to prepare such a plan;

.2.3 arrival and proposed departure draughts;

.2.4 time required for deballasting;

.2.5 the ship's length overall, beam, and length of the cargo area from the forward coaming of the forwardmost hatch to the after coaming of the aftmost hatch into which cargo is to be loaded or from which cargo is to be removed;

.2.6 distance from the waterline to the first hatch to be loaded or unloaded and the distance from the ship's side to the hatch opening;

.2.7 the location of the ship's accommodation ladder;

.2.8 air draught;

* Refer to MSC/Circ.663 and to the form for cargo information, which is set out in appendix 5.

.2.9 details and capacities of ship's cargo handling gear;

.2.10 number and type of mooring lines; and

.2.11 any other item related to the ship requested by the terminal.

.3 Similar information in respect of ETA, unloading plan and details of the ship are required by unloading terminals.

3.2.2 Ships arriving at loading or unloading terminals in a part-loaded condition should also advise:

.1 berthing displacement and draughts;

.2 previous loading or unloading port;

.3 nature and stowage of cargo already on board and, when solid bulk cargoes are on board, the Bulk Cargo Shipping Name (BCSN), the IMSBC Code Class and UN Number, when applicable.

.4 distribution of cargo on board, indicating that to be unloaded and that to remain on board.

3.2.3 Combination carriers (OBO or O/O) should advise of the following additional information:

.1 nature of the preceding three cargoes;

.2 date and place at which the last oil cargo was discharged;

.3 advice as to content of slop tanks and whether fully inerted and sealed; and

.4 date, place and name of authority that issued the last gas free certificate which includes pipelines and pumps.*

3.2.4 As soon as possible the ship should confirm that all holds into which cargo is to be loaded are clean, and free from previous cargo residues which in combination with the cargo to be loaded could create a hazard.

3.2.5 Information on the loading or unloading plan and on intended arrival and departure draughts should be progressively updated, and passed to the terminal as circumstances change.

* Refer to the chapter for combination carriers in the *International Safety Guide for Oil Tankers and Terminals (ISGOTT)* and in particular to the section on cargo changeover checklists and the section on discharge of bulk cargoes.

3.3 Information given by the terminal to the ship

3.3.1 On receipt of the ship's initial notification of its ETA, the terminal should give the ship the following information as soon as possible:

.1 the name of the berth at which loading or unloading will take place and the estimated times for berthing and completion of loading or unloading;

.2 characteristics of the loading or unloading equipment, including the terminal's nominal loading or unloading rate and the number of loading or unloading heads to be used;

.3 features of the berth or jetty the master may need to be aware of, including the position of fixed and mobile obstructions, fenders, bollards and mooring arrangements;

.4 minimum depth of water alongside the berth and in approach or departure channels;

.5 water density at the berth;

.6 the maximum distance between the waterline and the top of cargo hatch covers or coamings, whichever is relevant to the loading operation, and the maximum air draught;

.7 arrangements for gangways and access;

.8 which side of the ship is to be alongside the berth;

.9 maximum allowable speed of approach to the jetty and availability of tugs, their type and bollard pull;

.10 the loading sequence for different parcels of cargo, and any other restrictions if it is not possible to take the cargo in any order or any hold to suit the ship;

.11 any properties of the cargo to be loaded which may present a hazard when placed in contact with cargo or residues on board;

.12 advance information on the proposed cargo handling operations or changes to existing plans for cargo handling;

.13 if the terminal's loading or unloading equipment is fixed, or has any limits to its movement;

.14 mooring lines required;

.15 warning of unusual mooring arrangements;

.16 any restrictions on deballasting;

.17 maximum sailing draught permitted by the port authority; and

.18 any other items related to the terminal requested by the master.

3.3.2 Information on estimated times for berthing and departure and on minimum water depth at the berth should be progressively updated and passed to the master on receipt of successive ETA advices.

3.3.3 The terminal representative should be satisfied that the ship has been advised as early as possible of the information contained in the cargo declaration as required by chapter VI of SOLAS 1974, as amended.

Section 4
Procedures between the ship and the terminal prior to cargo handling

4.1 Principles

4.1.1 The master is responsible at all times for the safe loading and unloading of the ship, the details of which should be confirmed to the terminal representative in the form of a loading or unloading plan. In addition, the master should:

.1 ensure that the checklist in appendix 3 is completed in consultation with the terminal before loading or unloading is commenced;

.2 ensure that the loading or unloading of cargo and the discharge or intake of ballast water is under the control of the ship's officer in charge;

.3 ensure that the disposition of cargo and ballast water is monitored throughout the loading or unloading process to ensure that the ship's structure is not overstressed;

.4 ensure that the terminal representative is made aware of the requirements for harmonization between deballasting and cargo loading rates for his ship;

.5 ensure that ballast water is discharged at rates which conform to the agreed loading plan and do not result in flooding of the quay or of adjacent craft;

.6 retain on board sufficient officers and crew to attend to the adjustment of mooring lines or for any normal or emergency situation, having regard to the need of the crew to have sufficient rest periods to avoid fatigue;

.7 ensure the loading or unloading plans have been passed to and agreed with the terminal representative;

.8 ensure that the terminal representative is made aware of the cargo trimming requirements;

.9 ensure that appropriate information about the cargo to be loaded (appendix 5) has been received to enable safe stowage and carriage to be achieved;

.10 ensure that there is agreement between ship and shore as to the action to be taken in the event of rain, or other change in the weather, when the nature of the cargo would pose a hazard in the event of such a change; and

.11 ensure that no hot work is carried out on board the ship while the ship is alongside the berth except with the permission of the terminal representative and in accordance with any requirements of the port administration.

4.1.2 The terminal representative is responsible for loading or unloading cargo in accordance with the hatch sequence and tonnages stated on the ship's loading or unloading plan. In addition, the terminal representative should:

.1 complete the checklist in appendix 3 in consultation with the master before loading or unloading is commenced;

.2 not deviate from the loading or unloading plan unless by prior consultation and agreement with the master;

.3 trim the cargo, when loading or unloading, to the master's requirements;

.4 maintain a record of the weight and disposition of the cargo loaded or unloaded and ensure that the weights in the hold do not deviate from the plan;

.5 provide the master with the names and procedures for contacting the terminal personnel or shipper's agent who will have responsibility for the loading or unloading operation and with whom the master will have contact;

.6 avoid damage to the ship by the loading or unloading equipment and inform the master, if damage occurs;

.7 ensure that no hot work is carried out on board or in the vicinity of the ship while the ship is alongside the berth except with the permission of the master and in accordance with any requirements of the port administration; and

.8 ensure that there is agreement between the master and the terminal representative at all stages and in relation to all aspects of the loading or unloading operation.

4.2 Procedures

4.2.1 The following are considered important procedures in respect of cargo loading:

.1 the master and terminal representative should indicate agreement to the loading plan before commencement of loading by signing the plan in the spaces provided;

.2 the master should state on the agreed loading plan, the order in which the holds are to be loaded, the weight of each pour, the total weight in each hold and the amount of cargo for vessel trimming purposes, if required;

.3 the terminal representative, on receipt of the ship's initial loading plan (see 3.2.1), should advise the master of the nominal loading rate at which the ship may expect to receive the cargo and the estimated time required to complete each pour;

.4 where it is not practical for the ship to completely discharge its ballast water prior to reaching the trimming stage in the loading process, the master and the terminal representative should agree on the times at which loading may need to be suspended and the duration of such suspensions;

.5 the loading plan should be prepared so as to ensure that all ballast pumping rates and loading rates are considered carefully to avoid overstressing the hull;

.6 the quantities of cargo required to achieve the departure draft and trim should allow for all cargo on the terminal's conveyor systems to be run off and empty on completion of a loading. The terminal representative should advise the master of the nominal tonnage contained on its conveyor system and any requirements for clearing the conveyor system on completion of loading; and

.7 communication arrangements between the ship and terminal should be capable of responding to requests for information on the loading process and of prompt compliance in the event that the master or terminal representative orders loading to be suspended. Consideration should be given to the disposition of cargo on the conveyor systems and to the response time in the event of an emergency stop.

4.2.2 The following are considered important procedures in respect of cargo unloading:

.1 the terminal representative, when proposing or accepting the initial unloading plan, should advise the master of the nominal unloading rate and the estimated time required for each stage of the discharge;

.2 the master should advise the hold order and the weight to be unloaded in each stage of the discharge;

.3 the terminal representative should give the ship the maximum warning when it is intended to increase, or to reduce, the number of unloading heads used; and

.4 communication arrangements between ship and terminal should be capable of responding to requests for information on the unloading process, and of prompt compliance in the event that the master orders unloading to be suspended.

4.3 Implementation

4.3.1 The loading or unloading plan should be prepared in a form such as that shown in appendix 2. Worked examples of this form are also shown in appendix 2. A different form may be used provided it contains the essential information to meet the requirements of this Code. The minimum information for this purpose is that enclosed in the heavy line box on the sample form.

4.3.2 The loading or unloading plan should only be changed when a revised plan has been prepared, accepted and signed by both parties. Loading plans should be kept by the ship and terminal for a period of six months.

4.3.3 A copy of the agreed loading or unloading plan and any subsequent amendments to it should be lodged with the appropriate authority of the port State.

Section 5
Cargo loading and handling of ballast

5.1 General

5.1.1 When the cargo loading plan is agreed, the master and terminal representative should confirm the method of cargo operations so as to ensure no excessive stresses on the hull, tank top and associated structures, and exchange information to avoid any structural damage to the ship by cargo handling equipment.

5.1.2 The terminal representative should alert the master, when the cargo is heavy, or when the individual grab loads are large, that there may be high, localized impact loads on the ship's structure until the tank top is completely covered by cargo, especially when high free-fall drops are permitted. As such impacts have the potential for causing structural damage, special care should be taken at the start of the loading operation in each cargo hold.

5.1.3 Monitoring of the cargo handling operation, and effective communication between the terminal and ship, must be maintained at all times, and especially during final trimming of the ship.

5.1.4 Any requirement for cargo trimming should be in accordance with the procedures of the IMSBC Code, or the International Grain Code, as appropriate.

5.1.5 In order to effectively monitor the progress of the cargo loading operation it is essential for both the master and terminal representative to have readily accessible information on the total quantity loaded, as well as the quantities per pour.

5.1.6 On completion of loading, the master and the terminal representative should agree in writing that the ship has been loaded in accordance with the loading plan, including any agreed variations.

5.2 Ship duties

5.2.1 The master should advise the terminal representative of any deviation from the deballasting plan or any other matter which may affect cargo loading.

5.2.2 The ship should be kept upright or, if a list is required for operational reasons, it should be kept as small as possible.

5.2.3 The master should ensure close supervision of the loading operation and of the ship during final stages of loading. The master should advise the terminal representative when final trimming of the ship has to commence in order to allow for the conveyor system run-off.

5.3 Terminal duties

5.3.1 The terminal representative should advise the master on any change to the agreed loading rate and, at the completion of each pour, the terminal representative should advise the master of the weight loaded and that cargo loading continues in accordance with the agreed cargo plan.

5.3.2 The ship should be kept upright with the cargo distributed so as to eliminate any twisting of the ship's structure.

5.3.3 The terminal should use weight meters which are well maintained and provide an accuracy to within 1% of the rated quantity required over the normal range of loading rates. The terminal should frequently monitor the weight of cargo that is being loaded and inform the ship so that it can be compared with the cargo loading plan and the ship's calculation by draught marks.

Section 6
Unloading cargo and handling of ballast

6.1 General

6.1.1 When the cargo unloading plan is agreed, the master and terminal representative must confirm the method of cargo operations so as to ensure no excessive stresses on the hull, tank top and associated structures, including any measures to reduce and eliminate any structural damage to the ship by cargo handling equipment.

6.1.2 Monitoring and effective communication between the terminal and ship must be maintained at all times.

6.1.3 On completion of unloading, the master and the terminal representative should agree in writing that the ship has been unloaded in accordance with the agreed unloading plan, with the holds emptied and cleaned to the master's requirements, and should record any detected damage suffered by the ship.

6.1.4 In order to maintain an effective monitoring of the progress of the cargo unloading plan, it is essential for both the master and the terminal representative to have readily accessible information on the total unloaded quantity as well as on the quantities unloaded per hatch.

6.1.5 When ballasting one or more holds, master and terminal operator should take account of the possibility of the discharge of flammable vapours from the holds. Suitable precautions* should be taken before any hot work is permitted adjacent to or above that space.

6.2 Ship duties

6.2.1 The master will advise the terminal representative of any deviation from the ballasting plan or any other matter which may affect cargo unloading.

6.2.2 At the start and during all stages of unloading cargo, the master should ensure that frequent checks are made so that:

.1 cargo spaces and other enclosed spaces are well ventilated, and persons are allowed to enter them only after they have been declared safe for entry in accordance with the guidelines† developed by the Organization;

.2 the cargo is being unloaded from each hold in accordance with the agreed unloading plan;

.3 the ballasting operation is proceeding in accordance with the agreed unloading plan;

.4 the ship is securely moored, and that weather conditions are being monitored and local weather forecasts obtained;

.5 the ship's draught is read regularly to monitor the progress of the unloading;

.6 the terminal representative is warned immediately if the unloading process has caused damage, has created a hazardous situation, or is likely to do so;

.7 the ship is kept upright, or, if a list is required for operational reasons, it is kept as small as possible; and

.8 the unloading of the port side closely matches that of the starboard side in the same hold to avoid twisting the ship.

* Refer to the section on the operation of combination carriers in the *International Safety Guide for Oil Tankers and Terminals (ISGOTT)*.

† Refer to Assembly resolution A.864(20), Recommendations for entering enclosed spaces aboard ships.

6.2.3 The master should ensure close supervision of the final stages of the unloading, to ensure that all cargo is unloaded.

6.3 Terminal duties

6.3.1 The terminal representative should follow the agreed unloading plan and should consult with the master if there is a need to amend the plan.

6.3.2 The ship is to be kept upright or, if a list is required for operational reasons, it is to be kept as small as possible.

6.3.3 The unloading of the port side should closely match that of the starboard side in the same hold, to avoid twisting the ship.

6.3.4 Unloading rates and sequences should not be altered by the terminal unless by prior consultation and agreement between the master and the terminal representative.

6.3.5 The terminal representative should advise the master when unloading is considered to be completed from each hold.

6.3.6 The terminal should make every effort to avoid damage to the ship when using unloading or hold cleaning equipment. If damage does occur, it should be reported to the master and, if necessary, repaired. If the damage could impair the structural capability or watertight integrity of the hull, or the ship's essential engineering systems, the Administration or an organization recognized by it and the appropriate authority of the port State should be informed, so that they can decide whether immediate repair is necessary or whether it can be deferred. In either case, the action taken, whether to carry out the repair or defer it, should be to the satisfaction of the Administration or an organization recognized by it and the appropriate authority of the port State. Where immediate repair is considered necessary, it should be carried out to the satisfaction of the master before the ship leaves the port.

6.3.7 The terminal representative should monitor the weather conditions and provide the master with the forecast of any local adverse weather condition.

Appendix 1

Recommended contents of port and terminal information books

1 It is recommended that information books prepared by terminal operators, port authorities or both should contain the following information relating to their site-specific requirements:

1.1 Port information books:

.1 location of the port and the terminal

.2 details of port administration

.3 radiocommunication procedures and frequencies

.4 arrival information requirements

.5 port health, immigration, quarantine and customs regulations and procedures

.6 relevant charts and nautical publications

.7 pilotage requirements

.8 towage and tug assistance

.9 berthing and anchorage facilities

.10 port emergency procedures

.11 significant weather features

.12 availability of fresh water, provisions, bunkers and lubricants

.13 the maximum size of ship the port can accept

.14 maximum permissible draught and minimum depth of water in navigation channels

.15 water density at the port

.16 maximum permissible air draught

.17 requirements for ship's draught and trim for navigation in the waterways

.18 tidal and current information, as it affects ship movements

.19 restrictions or conditions on the discharge of ballast water

.20 statutory requirements regarding loading and cargo declaration

.21 information on waste reception facilities in the port

1.2 Terminal information books:

.1 details of terminal contact personnel

.2 technical data on the berths and loading or unloading equipment

.3 depth of water at the berth

.4 water density at the berth

.5 the minimum and maximum size of ship which the terminal's facilities are designed to accept, including the minimum clearance between deck obstructions

.6 mooring arrangements and attendance of mooring lines

.7 loading or unloading rates and equipment clearances

.8 loading or unloading procedures and communications

.9 cargo weight determinations by weightmeter and draught survey

.10 conditions for acceptance of combination carriers

.11 access to and from ships and berths or jetties

.12 terminal emergency procedures

.13 damage and indemnity arrangements

.14 landing location of accommodation ladder

.15 information on waste reception facilities at the terminal

1.3 Extreme cold weather information

Ports and terminals situated in regions subject to extreme cold weather should advise masters where to obtain information on operation of ships under such conditions.

Example Loading/Unloading Plan

The loading or unloading plan should be prepared in a form such as shown below. Worked examples of this form are shown overleaf. A different form may be used provided it contains the essential information enclosed in the heavy line box.

LOADING OR UNLOADING PLAN Version No.	Date	Vessel				Voyage No.
Load/Unload Port	Cargo(es)	Assumed stowage factor of cargo(es)	Ballast pumping rate	Dock water density	Max draught available (HW)	Max air draught in berth
To/from Port	Last cargo	No. of loaders/ dischargers	Load/ discharge rate		Min draught available (LW)	Max sailing/ arrival draught

Tonnes / Grade	11	10	9	8	7	6	5	4	3	2	1
Totals: Grade:		Tonnes	Grade:		Tonnes	Grade:		Tonnes	Total:		Tonnes

Pour No.	Cargo: Hold No.	Cargo: Tonnes	Ballast operations	Time required (hours)	Comments	Calculated values: Draught Fwd	Calculated values: Draught Aft	Calculated values: Maximum BM*	Calculated values: Maximum SF*	Calculated values: Air draught	Calculated values: Draught mid	Calculated values: Trim	Observed Values: Draught Fwd	Observed Values: Draught Aft	Observed Values: Draught Mid
	TOTAL														

NO DEVIATION FROM ABOVE PLAN WITHOUT PRIOR APPROVAL OF CHIEF MATE
Pours to be numbered 1A, 1B, 2A, 2B, etc when using two loaders
Abbreviations: PI = Pump In GI = Gravitate In F = Full PO = Pump Out GO = Gravitate Out MT = Empty
All entries within the box must be completed as far as possible. The entries outside the box are optional.

Signed Terminal

Signed Ship

*Bending moments (BM) & shear forces (SF) are to be expressed as a percentage of maximum permitted in-port values for intermediate stages, and of maximum permitted at-sea values for the final stage. Every step in the loading/unloading plan must remain within the allowable limits for hull girder shear forces, bending moments and tonnage per hold, where applicable. Loading/unloading operations may have to be paused to allow for ballasting/deballasting in order to keep actual values within limits.

Example Loading/~~Unloading~~ Plan

The loading or unloading plan should be prepared in a form such as shown below. A different form may be used provided it contains the essential information enclosed in the heavy line box.

LOADING OR ~~UNLOADING~~ PLAN Version No. 1	Date 96-03-24	Vessel BARBICAN				Voyage No. 044
Load/~~Unload~~ Port BOCA GRANDE	Cargo(es) IRON ORE	Assumed stowage factor of cargo(es) ~~FINES 1.6 cu ft/t~~ LUMP 16 cu ft/t	Ballast pumping rate 4000 t/hr	Dock water density 1.025	Max draught available (HW) 17.88m	Max air draught in berth N/A
To/~~from~~ Port JAPAN F.O.	Last cargo IRON ORE & COAL	No. of loaders/ ~~dischargers~~ 1	Load/ ~~discharge~~ rate 4500 t/hr		Min draught available (LW) 9.42m	Max sailing/ ~~arrival~~ draught 17.88m

Tonnes / Grade	11	10	9	8	7	6	5	4	3	2	1
			14756 FINES	17000 LUMP	17382 LUMP	16382 LUMP	16382 LUMP	16900 FINES	15382 LUMP	15766 LUMP	13050 FINES

Totals: Grade: FINES = 44706 Tonnes Grade: LUMP = 98294 Tonnes Grade: Tonnes Total: 143000 Tonnes

Pour No.	Cargo: Hold No.	Cargo: Tonnes	Ballast operations	Time required (hours)	Comments	Calculated values: Draught Fwd	Calculated values: Draught Aft	Calculated values: Maximum BM*	Calculated values: Maximum SF*	Calculated values: Air draught	Calculated values: Draught mid	Calculated values: Trim	Observed Values: Draught Fwd	Observed Values: Draught Aft	Observed Values: Draught Mid
1	4	10000	GO 1&3 UWT's	2.22	FINES	9.99	10.77	73	49		10.38	0.78			
2	1	7000	GO Upper Fore Peak PO 2 Hold	1.56	FINES changeover 2 Hold	10.14	10.48	66	53		10.31	0.34			
3	9	8000	GO 5 UWT's PO Afe peak	1.78	FINES	9.62	12.15	63	59		10.79	2.73			
4	4	6900	PO 1DB's	1.53	FINES	10.12	12.50	80	43		11.31	2.38			
5	9	6756	PO 5 DB's	1.50	FINES	9.56	13.74	80	45		11.65	4.18			
6	1	6050	PO Lower FP GO 2 UWT's	1.36	FINES	9.61	13.57	75	49		11.59	3.96			
					Change grade to LUMP										
7	7	10000	GO 6 Hold to 50%	2.22	LUMP	8.94	14.38	-58	55		11.66	5.43			
8	5	10000	PO 6 Hold	2.22	LUMP	9.63	13.63	-67	49		11.63	4.00			
9	7	7382	Educt 6 Hold	1.66	LUMP changeover 6 Hold	9.57	15.24	-64	47		12.41	5.67			
10	3	10000	PO 2&3 DB's	2.22	LUMP	10.41	16.65	-49	38		12.53	4.24			
11	8	10000	GO 4 UWT's	2.22	LUMP	9.58	16.66	-50	43		13.12	7.08			
12	5	6382	PO 4 DB's	1.42	LUMP	10.28	16.24	58	37		13.26	5.96			
13	8	6000	Educt as required	1.33	LUMP	9.90	17.88	53	38		13.89	7.98			
14	2	8000	Educt as required	1.78	LUMP	12.51	16.68	-65	46		14.60	4.17			
15	6	9000	Educt as required	2.00	LUMP	13.16	17.80	42	-21		15.47	4.66			
16	2	6000	Educt as required	1.33	LUMP	15.06	16.98	33	-14		16.02	1.92			
17	6	7382	Educt ballast lines	1.64	LUMP	15.59	17.88	48	-80		16.74	2.29			
18	3	5382	Shut down ballast	1.20	LUMP	16.95	17.54	44	-27		17.02	0.59			
					Trim check										
19	8	1000		0.22	LUMP	16.94	17.72	49	-30		17.33	0.79			
20	2	1766		0.39	LUMP	17.51	17.51	46	-27		17.51	0.00			
			DRAUGHT SURVEY		SEAGOING CONDITION	17.51	17.51	62	-36		17.51	0.00			
	TOTAL	143000													

NO DEVIATION FROM ABOVE PLAN WITHOUT PRIOR APPROVAL OF CHIEF MATE
Pours to be numbered 1A, 1B, 2A, 2B, etc when using two loaders
Abbreviations: PI = Pump In GI = Gravitate In F = Full PO = Pump Out GO = Gravitate Out MT = Empty
All entries within the box must be completed as far as possible. The entries outside the box are optional.

Signed Terminal Goldstein

Signed Ship A. Smith

*Bending moments (BM) & shear forces (SF) are to be expressed as a percentage of maximum permitted in-port values for intermediate stages, and of maximum permitted at-sea values for the final stage. Every step in the loading/unloading plan must remain within the allowable limits for hull girder shear forces, bending moments and tonnage per hold, where applicable. Loading/unloading operations may have to be paused to allow for ballasting/deballasting in order to keep actual values within limits.

Example ~~Loading~~/Unloading Plan

The loading or unloading plan should be prepared in a form such as shown below.
A different form may be used provided it contains the essential information enclosed in the heavy line box.

~~LOADING OR~~ UNLOADING PLAN Version No. 1	Date 96-05-15	Vessel BARBICAN			Voyage No. 044
~~Load~~/Unload Port CHIBA	Cargo(es) IRON ORE	Assumed stowage factor of cargo(es) FINES 14cft/t LUMP 16 cuft/t	Ballast pumping rate 6000 t/hr	Dock water density 1.025	Max draught available (HW) 17.35m	Max air draught in berth 60m
~~To~~/from Port BOCA GRANDE	Last cargo IRON ORE & COAL	No. of ~~loaders/~~ dischargers 2	~~Load/~~ discharge rate 1250 t/hr per grab		Min draught available (LW) 7.59m	Max ~~sailing~~/ arrival draught 17m

Hold	11	10	9	8	7	6	5	4	3	2	1
Tonnes			14756	16910	17382	16382	16382	16900	15382	15470	13050
Grade			FINES	LUMP	LUMP	LUMP	LUMP	FINES	LUMP	LUMP	FINES

Totals: Grade: FINES = 44706 Tonnes Grade: LUMP = 97908 Tonnes Grade: —— Tonnes Total: 142614 Tonnes

Pour No.	Cargo: Hold No.	Cargo: Tonnes	Ballast operations	Time required (hours)	Comments	Calculated values: Draught Fwd	Draught Aft	Maximum BM*	Maximum SF*	Calculated values: Air draught	Draught mid	Trim	Observed Values: Draught Fwd	Aft	Mid
1A	2	15470	GI 1&2 DB's PI 2UWT's	13.2	LUMP 2&6 Holds MT	13.82	16.29	-72	48			2.47			
1B	6	16382													
2A	5	10000	GI 4DB's PI 4 UWT's	8.0	LUMP	13.66	14.54	71	56			1.10			
2B	8	10000													
3A	3	9000	GI 3DB's	7.2	LUMP	12.19	13.68	77	78			1.49			
3B	7	9000													
4A	5	6382	GI 5DB's	5.5	LUMP 5&8 Holds MT	12.67	15.22	68	38			2.55			
4B	8	6910	PI 6Hold to 0.5m ullage												
5A	3	6382		6.7	LUMP 3&7 Holds MT	11.05	13.94	-91	59			2.89			
5B	7	8382													
			Draught survey and change grade to FINES												
6A	1	6000	PI 1&5 UWT's	4.8	FINES	9.75	16.01	83	42			4.26			
6B	9	6000													
7A	4	8756		7.0	FINES	9.38	10.64	80	52			1.26			
7B	9	8756													
8A	1	7050	GI & PI Lower Forepeak	6.5	FINES	7.59	11.30	84	-82			3.71			
8B	4	8164	PI Upper Forepeak & 3UWT's												
					SEAGOING CONDITION	7.59	11.30	84	-82			3.31			
	TOTAL	142614													

Instructions ① Please empty No.6 Hold and leave as clean as possible. This will then be used for ballast during stage 6.
② Grab and bulldozer blades must not be allowed to strike the ship's structure. Please instruct drivers to take special care.
③ Please note there are bilge and eductor plates in the after corners of each hold. Care required in these areas.
④ All damage to be reported. Holds to be surveyed on cargo completion.

Signed Terminal [signature]
Signed Ship A. Smith

NO DEVIATON FROM ABOVE PLAN WITHOUT PRIOR APPROVAL OF CHIEF MATE
Pours to be numbered 1A, 1B, 2A, 2B, etc when using two loaders
Abbreviations: PI = Pump In GI = Gravitate In F = Full PO = Pump Out GO = Gravitate Out MT = Empty
All entries within the box must be completed as far as possible. The entries outside the box are optional.

*Bending moments (BM) & shear forces (SF) are to be expressed as a percentage of maximum permitted in-port values for intermediate stages, and of maximum permitted at-sea values for the final stage. Every step in the loading/unloading plan must remain within the allowable limits for hull girder shear forces, bending moments and tonnage per hold, where applicable. Loading/unloading operations may have to be paused to allow for ballasting/deballasting in order to keep actual values within limits.

Appendix 3

Ship/Shore safety checklist for loading or unloading dry bulk cargo carriers

Date ....

Port .... Terminal/Quay ....

Available depth of water in berth .... Minimum air draught* ....

Ship's name ....

Arrival draught (read/calculated) .... Air draught ....

Calculated departure draught .... Air draught ....

The master and terminal manager, or their representatives, should complete the checklist jointly. Advice on points to be considered is given in the accompanying guidelines. The safety of operations requires that all questions should be answered affirmatively and the boxes ticked. If this is not possible, the reason should be given, and agreement reached upon precautions to be taken between ship and terminal. If a question is considered to be not applicable write "N/A", explaining why if appropriate.

		SHIP	TERMINAL
1.	Is the depth of water at the berth, and the air draught, adequate for the cargo operations to be completed?	☐	☐
2.	Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?	☐	☐
3.	In emergency, is the ship able to leave the berth at any time?	☐	☐
4.	Is there safe access between the ship and the wharf? *Tended by ship/terminal* .... (cross out as appropriate)	☐	☐
5.	Is the agreed ship/terminal communications system operative? *Communication method* .... *Language* .... *Radio channels/phone numbers*	☐	☐

* The term *air draught* should be construed carefully: if the ship is in a river or an estuary, it usually refers to maximum mast height for passing under bridges, while on the berth it usually refers to the height available or required under the loader or unloader.

	SHIP	TERMINAL
6. Are the liaison contact persons during operations positively identified? *Ship contact persons* . . . . . . *Shore contact person(s)* . . . . . . *Location*	☐	☐
7. Are adequate crew on board, and adequate staff in the terminal, for emergency?	☐	☐
8. Have any bunkering operations been advised and agreed?	☐	☐
9. Have any intended repairs to wharf or ship whilst alongside been advised and agreed?	☐	☐
10. Has a procedure for reporting and recording damage from cargo operations been agreed?	☐	☐
11. Has the ship been provided with copies of port and terminal regulations, including safety and pollution requirements and details of emergency services?	☐	☐
12. Has the shipper provided the master with the properties of the cargo in accordance with the requirements of chapter VI of SOLAS?	☐	☐
13. Is the atmosphere safe in holds and enclosed spaces to which access may be required, have fumigated cargoes been identified, and has the need for monitoring of atmosphere been agreed by ship and terminal?	☐	☐
14. Have the cargo handling capacity and any limits of travel for each loader/unloader been passed to the ship/terminal? *Loader* . . . . . . *Loader* . . . . . . *Loader*	☐	☐
15. Has a cargo loading or unloading plan been calculated for all stages of loading/deballasting or unloading/ballasting? *Copy lodged with*	☐	☐
16. Have the holds to be worked been clearly identified in the loading or unloading plan, showing the sequence of work, and the grade and tonnage of cargo to be transferred each time the hold is worked?	☐	☐
17. Has the need for trimming of cargo in the holds been discussed, and have the method and extent been agreed?	☐	☐

	SHIP	TERMINAL
18. Do both ship and terminal understand and accept that if the ballast programme becomes out of step with the cargo operation, it will be necessary to suspend cargo operation until the ballast operation has caught up?	☐	☐
19. Have the intended procedures for removing cargo residues lodged in the holds while unloading, been explained to the ship and accepted?	☐	☐
20. Have the procedures to adjust the final trim of the loading ship been decided and agreed? *Tonnage held by the terminal conveyor system*	☐	☐
21. Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?	☐	☐

THE ABOVE HAS BEEN AGREED:

Time. . . . . Date . . . . . .

For ship . . . . . For terminal . . . . . .

Rank . . . . . Position/Title . . . . . .

Appendix 4

Guidelines for completing the ship/shore safety checklist

The purpose of the ship/shore safety checklist is to improve working relationships between ship and terminal, and thereby to improve the safety of operations. Misunderstandings occur and mistakes can be made when ships' officers do not understand the intentions of the terminal personnel, and the same applies when terminal personnel do not understand what the ship can and cannot safely do.

Completing the checklist together is intended to help ship and terminal personnel to recognize potential problems, and to be better prepared for them.

1 *Is the depth of water at the berth, and the air draught,* adequate for the cargo operations to be completed?*

The depth of water should be determined over the entire area the ship will occupy, and the terminal should be aware of the ship's maximum air draught and water draught requirements during operations. Where the loaded draught means a small underkeel clearance at departure, the Master should consult and confirm that the proposed departure draught is safe and suitable.

The ship should be provided with all available information about density and contaminates of the water at the berth.

2 *Are mooring arrangements adequate for all local effects of tide, current, weather, traffic and craft alongside?*

Due regard should be given to the need for adequate fendering arrangements. Ships should remain well secured in their moorings. Alongside piers or quays, ranging of the ship should be prevented by keeping mooring lines taut; attention should be given to the movement of the ship caused by tides, currents or passing ships and by the operation in progress.

Wire ropes and fibre ropes should not be used together in the same direction because of differences in their elastic properties.

* The term *air draught* should be construed carefully: if the ship is in a river or an estuary, it usually refers to maximum mast height for passing under bridges, while on the berth it usually refers to the height available or required under the loader or unloader.

3 *In emergency, is the ship able to leave the berth at any time?*

The ship should normally be able to move under its own power at short notice, unless agreement to immobilize the ship has been reached with the terminal representative, and the port authority where applicable.

In an emergency a ship may be prevented from leaving the berth at short notice by a number of factors. These include low tide, excessive trim or draught, lack of tugs, no navigation possible at night, main engine immobilized, etc. Both the ship and the terminal should be aware if any of these factors apply, so that extra precautions can be taken if need be.

The method to be used for any emergency unberthing operation should be agreed taking into account the possible risks involved. If emergency towing-off wires are required, agreement should be reached on their position and method of securing.

4 *Is there safe access between the ship and the wharf?*

The means of access between the ship and the wharf must be safe and legal, and may be provided by either ship or terminal. It should consist of an appropriate gangway or accommodation ladder with a properly fastened safety net underneath it. Access equipment must be tended, since it can be damaged as a result of changing heights and draughts; persons responsible for tending it must be agreed between the ship and terminal, and recorded in the checklist.

The gangway should be positioned so that it is not underneath the path of cargo being loaded or unloaded. It should be well illuminated during darkness. A lifebuoy with a heaving line should be available on board the ship near the gangway or accommodation ladder.

5 *Is the agreed ship/terminal communications system operative?*

Communication should be maintained in the most efficient way between the responsible officer on duty on the ship and the responsible person ashore. The selected system of communication and the language to be used, together with the necessary telephone numbers and/or radio channels, should be recorded in the checklist.

6 *Are the liaison contact persons during operations positively identified?*

The controlling personnel on ship and terminal must maintain an effective communication with each other and their respective supervisors. Their names, and if appropriate where they can be contacted, should be recorded in the checklist.

The aim should be to prevent development of hazardous situations, but if such a situation does arise, good communication and knowing who has proper authority can be instrumental in dealing with it.

7 ***Are adequate crew on board, and adequate staff in the terminal, for emergency?***

It is not possible or desirable to specify all conditions, but it is important that a sufficient number of personnel should be on board the ship, and in the terminal throughout the ship's stay, to deal with an emergency.

The signals to be used in the event of an emergency arising ashore or on board should be clearly understood by all personnel involved in cargo operations.

8 ***Have any bunkering operations been advised and agreed?***

The person on board in charge of bunkering must be identified, together with the time, method of delivery (hose from shore, bunker barge, etc.) and the location of the bunker point on board. Loading of bunkers should be co-ordinated with the cargo operation. The terminal should confirm agreement to the procedure.

9 ***Have any intended repairs to wharf or ship whilst alongside been advised and agreed?***

Hot work, involving welding, burning or use of naked flame, whether on the ship or the wharf may require a hot work permit. Work on deck which could interfere with cargo work will need to be co-ordinated.

In the case of combination carriers a gas free certificate (including for pipelines and pumps) will be necessary, issued by a shore chemist approved by the terminal or port authority.

10 ***Has a procedure for reporting and recording damage from cargo operations been agreed?***

Operational damage can be expected in a harsh trade. To avoid conflict, a procedure must be agreed, before cargo operations commence, to record such damage. An accumulation of small items of damage to steel work can cause significant loss of strength for the ship, so it is essential that damage is noted, to allow prompt repair.

11 ***Has the ship been provided with copies of port and terminal regulations, including safety and pollution requirements and details of emergency services?***

Although much information will normally be provided by a ship's agent, a fact sheet containing this information should be passed to the ship on arrival, and should include any local regulations controlling the discharge of ballast water and hold washings.

12 ***Has the shipper provided the master with the properties of the cargo in accordance with the requirements of chapter VI of SOLAS?***

The shipper should pass to the master, for example, the grade of cargo, particle size, quantity to be loaded, stowage factor, and cargo moisture content. The IMSBC Code gives guidance on this.

The ship should be advised of any material which may contaminate or react with the planned cargo, and the ship should ensure that the holds are free of such material.

13 ***Is the atmosphere safe in holds and enclosed spaces to which access may be required, have fumigated cargoes been identified, and has the need for monitoring of atmosphere been agreed by ship and terminal?***

Rusting of steelwork or the characteristics of a cargo may cause a hazardous atmosphere to develop. Consideration should be given to: oxygen depletion in holds; the effect of fumigation either of cargo to be discharged, or of cargo in a silo before loading from where gas can be swept on board along with the cargo with no warning to the ship; and leakage of gases, whether poisonous or explosive, from adjacent holds or other spaces.

14 ***Have the cargo handling capacity and any limits of travel for each loader/unloader been passed to the ship/terminal?***

The number of loaders or unloaders to be used should be agreed, and their capabilities understood by both parties. The agreed maximum transfer rate for each loader/unloader should be recorded in the checklist.

Limits of travel of loading or unloading equipment should be indicated. This is essential information when planning cargo operations in berths where a ship must be shifted from one position to another due to loading. Gear should always be checked for faults and that it is clear of contaminates from previous cargoes. The accuracy of weighing devices should be ascertained frequently.

15 ***Has a cargo loading and unloading plan been calculated for all stages of loading/deballasting or unloading/ballasting?***

Where possible the ship should prepare the plan before arrival. To permit her to do so the terminal should provide whatever information the ship requests for planning purposes. On ships which require longitudinal strength calculations, the plan should take account of any permissible maxima for bending moments and shear forces.

The plan should be agreed with the terminal and a copy passed over for use by terminal staff. All watch officers on board and terminal supervisors should have access to a copy. No deviation from the plan should be allowed without agreement of the master.

According to SOLAS regulation VI/7, it is required to lodge a copy of the plan with the appropriate authority of the port State. The person receiving the plan should be recorded in the checklist.

16 ***Have the holds to be worked been clearly identified in the loading or unloading plan, showing the sequence of work, and the grade and tonnage of cargo to be transferred each time the hold is worked?***

The necessary information should be provided in the form as set out in appendix 2 of this Code.

17 ***Has the need for trimming of cargo in the holds been discussed, and have the method and extent been agreed?***

A well-known method is spout trimming, and this can usually achieve a satisfactory result. Other methods use bulldozers, front-end loaders, deflector blades, trimming machines or even manual trimming. The extent of trimming will depend upon the nature of the cargo, and must be in accordance with the IMSBC Code, or the International Grain Code, as appropriate.

18 ***Do both ship and terminal understand and accept that if the ballast programme becomes out of step with the cargo operations, it will be necessary to suspend cargo operations until the ballast operation has caught up?***

All parties will prefer to load or discharge the cargo without stops if possible. However, if the cargo or ballast programmes are out of step a stop to cargo handling must be ordered by the master and accepted by the terminal to avoid the possibility of inadvertently overstressing the ship's structure.

A cargo operations plan will often indicate cargo check points, when conditions will also allow confirmation that the cargo and ballast handling operations are in alignment.

If the maximum rate at which the ship can safely accept the cargo is less than the cargo handling capacity of the terminal, it may be necessary to negotiate pauses in the cargo transfer programme or for the terminal to operate equipment at less than the maximum capacity.

In areas where extremely cold weather is likely, the potential for frozen ballast or ballast lines should be recognized.

19 ***Have the intended procedures for removing cargo residues lodged in the holds while unloading been explained to the ship and accepted?***

The use of bulldozers, front-end loaders or pneumatic/hydraulic hammers to shake material loose should be undertaken with care, as wrong procedures can damage or distort ships' steel work. Prior agreement to the need and method intended, together with adequate supervision of operators, will avoid subsequent claims or weakening of the ship's structure.

20 ***Have the procedures to adjust the final trim of the loading ship been decided and agreed?***

Any tonnages proposed at the commencement of loading for adjusting the trim of the ship can only be provisional, and too much importance should not be attached to them. The significance lies in ensuring that the requirement is not overlooked or ignored. The actual quantities and positions to be used to achieve final ship's trim will depend upon the draft readings taken immediately beforehand. The ship should be informed of the tonnage on the conveyor system since that quantity may be large and must still be loaded when the order "stop loading" is given. This figure should be recorded in the checklist.

21 ***Has the terminal been advised of the time required for the ship to prepare for sea, on completion of cargo work?***

The procedure of securing for sea remains as important as it ever was, and should not be skimped. Hatches should be progressively secured on completion so that only one or two remain to be closed after cargo work is finished.

Modern deep-water terminals for large ships may have very short passages before the open sea is encountered. The time needed to secure, therefore, may vary between day or night, summer or winter, fine weather or foul weather.

Early advice must be given to the terminal if any extension of time is necessary.

Appendix 5

Form for cargo information for solid bulk cargoes

BCSN	
Shipper	Transport document number
Consignee	Carrier
Name/means of transport Port/place of departure	Instructions or other matters
Port/place of destination	
General description of the cargo (type of material/particle size)	Gross mass (kg/tonnes)
Specifications of bulk cargo, if applicable: Stowage factor: Angle of repose, if applicable: Trimming procedures: Chemical properties if potential hazard:* * e.g., Class & UN No. or "MHB"	
Group of the cargo ☐ Group A and B* ☐ Group A* ☐ Group B ☐ Group C * For cargoes which may liquefy (Group A and Group A and B cargoes)	Transportable moisture limit Moisture content at shipment
Relevant special properties of the cargo (e.g., highly soluble in water)	Additional certificate(s)* ☐ Certificate of moisture content and transportable moisture limit ☐ Weathering certificate ☐ Exemption certificate ☐ Other (specify) * If required
DECLARATION I hereby declare that the consignment is fully and accurately described and that the given test results and other specifications are correct to the best of my knowledge and belief and can be considered as representative for the cargo to be loaded.	Name/status, company/organization of signatory Place and date Signature on behalf of shipper

MSC/Circ.1160

Manual on loading and unloading of solid bulk cargoes for terminal representatives

1 The Maritime Safety Committee (MSC), at its seventy-sixth session, in considering the Report of the Working Group on Bulk Carrier Safety concerning the issue of the risk control options for the improvement of the ship/terminal interface for bulk carriers noted the need to harmonize training programmes for terminal personnel world-wide.

2 The Maritime Safety Committee, at its seventy-sixth session, further noted that the above concern could be addressed by the application of the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) and that the risk control options in the Manual on loading and unloading of solid bulk cargoes for terminal representatives under development would address the concerns referred to above.

3 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), agreed that the application of the BLU Code would address the concerns on risk control options above and urged Member Governments, shipowners, ship operators and terminals to apply the guidance contained therein.

4 The Maritime Safety Committee, at its seventy-eighth session (12 to 21 May 2004), agreed to continue the development of the Manual on loading and unloading of solid bulk cargoes for terminal representatives, taking into account the guidance in the IBTA guidelines for terminal representatives at ship/shore interface, when finalizing the Manual.

5 The Maritime Safety Committee, at its eightieth session (11 to 20 May 2005), approved the Manual on loading and unloading of solid bulk cargoes for terminal representatives and agreed that the application of the guidance contained therein would address the concerns on risk control options and urged Member Governments, shipowners, ship operators and terminals to apply the guidance contained therein.

6 Member Governments are invited to implement the BLU Code and to bring the annexed Manual on loading and unloading of solid bulk cargoes for terminal representatives, to the attention of terminals, shipowners, ship operators, shipmasters, shippers, receivers and other parties concerned.

Foreword

1 In response to the continuing loss of ships carrying solid bulk cargoes – sometimes without trace and with heavy loss of life – the Code of Safe Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) was developed by IMO as one of a number of measures to enhance the operational and structural safety of bulk carriers. It was adopted as a recommendatory instrument by the International Maritime Organization's Assembly at its twentieth session in November 1997 by resolution A.862(20) and amended by resolutions MSC.238(82) and MSC.304(87).

2 Possible stress and damage imposed by cargo handling throughout the life of a ship was considered to be a possible contributory cause of structural failure of bulk carriers leading to casualties and losses. The purpose of the BLU Code, therefore, is to provide guidance to ship masters of bulk carriers, terminal operators and other parties for the safe handling, loading and unloading of solid bulk cargoes.

3 To augment the BLU Code, the Manual on loading and unloading of solid bulk cargoes for terminal representatives (BLU Manual) is intended to provide more detailed guidance to Terminal Representatives (as defined in the BLU Code) and others involved in the handling of solid bulk cargoes; including those responsible for the training of personnel.

4 It should be noted that in this Manual, a reference to an appendix is a reference to an appendix in the BLU Code and a reference to an annex is to an annex in this Manual.

5 Further guidance on the safe loading and unloading of solid bulk cargoes is contained in the following publications:

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Introduction

1 The BLU Code applies to the loading and unloading of solid bulk cargoes, to or from bulk carriers of more than 500 gross tonnage. The BLU Code does not apply to ships which are not bulk carriers, by definition, and ships which are being loaded or unloaded using shipboard equipment only.

2 The guidance in this Manual is intended to complement the BLU Code by providing guidance on good practice, regardless of ship size, terminal capacity or cargo quantity. This should assist terminal representatives to implement the Code.

3 Although this Manual is written primarily in the context of the operation of major bulk terminals operating ship loaders and unloaders, smaller bulk facilities and non specialist terminals may also load and/or unload solid bulk cargoes by grabs, conveyors, chutes or even directly from vehicles etc. Not all the guidance in the Manual may be appropriate to such smaller terminals and facilities and the ships they serve but the general principles should still apply and be followed.

4 The guidance in this Manual is intended primarily to assist Terminal Representatives to understand the key issues to be dealt with at the interface between the ship and the terminal. It should also assist relevant ships' personnel to understand the issues involved from the terminal's perspective.

5 It should be noted that in this Manual, a reference to an appendix is a reference to an appendix in the BLU Code and a reference to an annex is to an annex in this Manual.

6 In the event of a conflict between the Code of Safe Practice for Solid Bulk Cargoes (BC Code) and the International Code for the Safe Carriage of Grain in Bulk (International Grain Code), the provisions of the International Grain Code should prevail.

Layout of guidelines

The text with the grey bar contains the specific language of the BLU Code and that without the grey bar contains the guidelines for the terminal representative.

Definitions

Definitions contained in the BLU Code are on page 47. In addition, the following definitions refer to a number of other expressions used in these guidelines.

BLU Code means the Code of Practice for the Safe Loading and Unloading of Bulk Carriers, as contained in the annex to IMO Assembly resolution A.862(20) of 27 November 1997.

Bulk carrier means a ship which is constructed generally with single deck, top-side tanks and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk, and includes such types as ore carriers and combination carriers.*

Cargo air draught means the distance from the surface of the water to the lowest point of the loader or unloader when in a fully raised position.

Terminal means any fixed, floating or mobile facility equipped and used for the loading and/or unloading of bulk cargo. The term includes that part of a dock, pier, berth, jetty, quay, wharf or similar structure at which a ship may tie up.

Shipper/receiver means any person in whose name or on whose behalf a contract of carriage of goods by sea has been concluded, or on whose behalf the goods are delivered to or received from the ship in relation to the contract of carriage by sea.

Stowage factor is the number of cubic metres which one tonne of the material will occupy.

* Refer to resolution MSC.79(70) relating to interpretation of provisions of SOLAS chapter XII on additional safety measures for bulk carriers.

Section 1
Definitions

BLU Code

1.1 *Air draught* means the vertical distance from the surface of the water to the highest point of mast or aerial.

1.2 *Bulk Cargo Shipping Name (BCSN)* identifies a bulk cargo during transport by sea. When a cargo is listed in the IMSBC Code, the Bulk Cargo Shipping Name of the cargo is identified by capital letters in the individual schedules or in the index. When the cargo is a dangerous good, as defined in the International Maritime Dangerous Goods (IMDG) Code, as defined in regulation VII/1.1 of the SOLAS Convention, the Proper Shipping Name of that cargo is the Bulk Cargo Shipping Name.

1.3 *Combination carriers (OBO or O/O)* means a ship whose design is similar to a conventional bulk carrier but is equipped with pipelines, pumps and inert gas plant so as to enable the carriage of oil cargoes in designated spaces.

1.4 *Conveyor system* means the entire system for delivering cargo from the shore stockpile or receiving point to the ship.

1.5 *Hot work* means the use of open fires and flames, power tools or hot rivets, grinding, soldering, burning, cutting, welding or any other repair work involving heat or creating sparks which may lead to a hazard because of the presence or proximity of flammable atmosphere.

1.6 *IMSBC Code* means the International Maritime Solid Bulk Cargoes Code as defined in regulation VI/1.1 of the SOLAS Convention.

1.7 *List indication lights* means lights, visible from the deck, which light up to show that a ship is listing.

1.8 *Master* means the master of the ship or a ship's officer designated by the master.

1.8 Standard shipping industry practice is that the Chief Officer (First Mate) is the designated officer in charge of cargo operations, and is the person with whom the terminal representative will normally liaise.

1.9 *Pour* means the quantity of cargo poured through one hatch opening as one step in the loading plan, i.e., from the time the spout is positioned over a hatch opening until it is moved to another hatch opening.

1.10 *Solid bulk cargo* means any cargo, other than a liquid or a gas, consisting of a combination of particles, granules or any larger pieces of material generally uniform in composition which is loaded directly into the cargo spaces of a ship without any intermediate form of containment.

1.11 *Terminal representative* means a person appointed by the terminal or other facility where the ship is loading or unloading, who has responsibility for operations conducted by that terminal or facility with regard to the particular ship.

1.11 For reasons of practicality it is accepted that the role of terminal representative cannot be limited to one person throughout the entire loading or unloading period, and that provision must be made for shift patterns and compliance with hours of work agreements and regulations.

1.12 *Trimming* (loading cargo) is the partial or total levelling of the cargo within the holds, by means of loading spouts or chutes, portable machinery, equipment or manual labour.

1.13 *Trimming* (unloading cargo) is the shovelling or sweeping up of smaller quantities of the cargo in the holds by mechanical means (such as bulldozers) or other means to place them in a convenient position for discharge.

1.14 *Trimming* (ship) is the adding, removal or shifting of weight in a ship to achieve the required forward and aft draughts.

Section 2
Suitability of ships and terminals

2.1 General

2.1.1 All ships nominated for loading should hold the appropriate valid statutory certification including, if required, the document of compliance* for ships carrying solid dangerous goods in bulk. It is recommended that the period of validity of the ship's certificates be sufficient to remain valid during loading, voyage and unloading times, plus a reserve to allow for delays in berthing, inclement weather or both.

2.1.2 The shipowner, manager or operator, when offering a ship for a particular cargo or service, should ensure that the ship:

- is maintained in a sound, seaworthy condition;
- has on board a competent crew;
- has on board at least one officer proficient in the languages used at both the loading and unloading ports, or has an officer available who is proficient in the English language; and
- is free of defects that may prejudice the ship's safe navigation, loading or unloading.

2.1.2 Terminals should determine the suitability of a ship for compatibility with both loading and/or unloading terminal infrastructure as appropriate.

2.1.3 It is essential that a ship selected to transport a solid bulk cargo be suitable for its intended purpose taking into account the terminals at which it will load or unload.

2.1.3 It is important that the terminal operator keeps its relevant customers informed of current terminal standards, limitations and operating conditions in terms of any changes to relevant navigational conditions, water depths, loading/unloading equipment and rates.

* Applicable to ships constructed on or after 1 September 1984.

2.1.4 The charterer and shipper when accepting a ship for a particular cargo or service should ensure that the ship:

- is suitable for access to the planned loading or unloading facilities; and
- does not have cargo handling equipment which would inhibit the safety of the loading and unloading operations.

2.1.4 In addition to the checks carried out by the charterer and/or shipper and/or receiver, the terminal operator should take reasonable steps to assure that all bulk carriers nominated for loading/unloading at the terminal are operationally suitable in all respects for the purpose.

The following checks are examples of the type of checks that may be carried out:

.1 Check appropriate sources of information to confirm that ship meets berth maximum and minimum size limits.

- Length overall/beam/draft.
- Number of holds.
- Hatch lengths and widths. Compare dimensions with the most suitable hatch openings on the basis of the terminal's own experience. If hatches are less than the preferred size, loader/unloader operators should be informed and appropriate precautions taken.
- Gearless/geared/gear type. Location of gear.
- Working length from forward end of No.1 hold to aft end of aft hold.
- Any equipment, design details or performance limitations that could affect the safety or efficiency of the operation.

.2 The ship's owner, master or agent and the terminal representative should exchange pre-arrival ship/shore information, as per the examples in annex 1.

2.2 Ships

2.2.1 Ships nominated for bulk loading should be suitable for the intended cargo. Suitable ships should be:

.1 weathertight, and efficient in all respects for the normal perils of the sea and the intended voyage;

.2 provided with an approved stability and loading booklet written in a language understood by the ship's officers concerned and using standard expressions and abbreviations. If the language is neither English, nor French, nor Spanish, a translation into one of these languages should be included;

.3 provided with hatch openings of sufficient size to enable the cargo to be loaded, stowed and unloaded satisfactorily; and

.4 provided with the hatch identification numbers used in the loading manual and loading or unloading plan. The location, size and colour of these numbers should be chosen so that they are clearly visible to the operator of the loading or unloading equipment.

2.2.1 The ship should ensure the hatches are adequately identified.

2.2.2 It is recommended that all ships which are required to carry out stress calculations should have on board an approved loading instrument for the rapid calculation of such stresses.

2.2.3 All propulsion and auxiliary machinery should be in good functional order. Deck equipment related to mooring and berthing operations, including anchors, cables, mooring lines, hawsers and winches, should be operable and in good order and condition.

2.2.4 All hatches, hatch operating systems and safety devices should be in good functional order, and used only for their intended purpose.

2.2.5 List indication lights, if fitted, should be tested prior to loading or unloading and proved operational.

2.2.6 Ship's own cargo-handling equipment should be properly certificated and maintained, and used only under the general supervision of suitably qualified ship's personnel.

2.3 Terminals

2.3.1 Terminal operators should ensure that they only accept ships that can safely berth alongside their installation, taking into consideration issues such as:

.1 water depth at the berth;

.2 maximum size of the ship;

.3 mooring arrangements;

.4 fendering;

.5 safe access; and

.6 obstructions to loading/unloading operations.

2.3.1.1 Terminal representatives should ensure that the following matters are considered:

.1 Tidal situation for the period concerned.

.2 Weather forecasts.

.3 Whether ship will berth port or starboard side-to.

.4 Tug and line boat requirements.

.5 Mooring requirements taking into account:

.1 the size and type of ship;

.2 local tidal conditions and foreseeable weather conditions;

.3 the nature of the cargo and ballasting operations.

.6 Any obstructions to berthing/unberthing operations.

.7 The terminal operator should ensure an unobstructed and safe passage between the ship's gangway and the entrance (gate) of the terminal.

2.3.1.2 Pre-arrival ship/shore exchange of information should clarify:

.1 Whether ship or terminal will provide the gangway. Responsibility for providing safety net, lighting and care of gangway. Generally the master is responsible for ensuring that there is safe access to and from the ship. Normally the ship provides the gangway and master and terminal representative jointly confirm that it is safe and suitable. Where the

ship's own gangway is not suitable the terminal may provide one. However, the master is still obliged to ensure that it is maintained in a safe condition at all times.

.2 If ship is geared, the ship's/charterer should provide a plan of the ship giving the positions of the derricks or cranes, and the distances between them. The terminal representative should check the validity of test reports and certificates for cranes.

.3 Loader/unloader booms should be raised clear of berth in good time when a ship is berthing/unberthing.

.4 Loaders/unloaders should be parked clear of the normal angle of approach of a berthing ship, in case the bow overshoots the jetty.

2.3.2 Terminal equipment should be properly certificated and maintained in accordance with the relevant national regulations and/or standards, and only operated by duly qualified and, if appropriate, certificated personnel.

2.3.2 "Maintenance" refers not just to running repairs and upkeep of equipment, but to the planned and systematic inspection and maintenance of equipment at periodic intervals. This is normally carried out in accordance with manufacturer's recommendations, national requirements, and industry codes of practice.

2.3.2.1 Where automatic weighing equipment is provided, this should be calibrated at regular intervals.

2.3.2.1 "Examination and testing" means the thorough examination of the crane or equipment at regular intervals, in accordance with relevant legislation and insurance requirements. Items needing particular attention include:

.1 Lifting equipment.

.2 Rotating equipment.

.3 Access equipment.

.4 Safety devices – alarms, anemometers, limit switches and controls, emergency stops, emergency escape and fire control equipment.

.5 Structural steelwork for corrosion, fatigue or cracking.

.6 Travel drive motors and braking systems, including storm anchoring arrangements.

.7 Lubrication – adequate and regular application of correct lubricants.

2.3.2.2 "Good housekeeping" means that the entire terminal area and all the equipment on it should be:

.1 Kept in a clean and tidy manner, with everything in its place and a place for everything.

.2 Maintained to a high standard of safety and safety awareness.

.3 Kept to a high standard of mechanical, electrical and structural maintenance.

2.3.3 Terminal personnel should be trained in all aspects of safe loading and unloading of bulk carriers, commensurate with their responsibilities.

2.3.3.1 The training should be designed to provide familiarity with the general hazards of loading, unloading and carriage of bulk cargoes and the adverse effect improper cargo handling operations may have on the safety of the ship.

2.3.3 Commensurate with their responsibilities, terminal personnel should be able to:

.1 Understand the basic principles of bulk carrier construction.

.2 Understand how loading/unloading operations can overstress and damage a ship and know why and how this must be avoided.

.3 Understand the roles and responsibilities, as required under the BLU Code, of:

.1 The terminal representative.

.2 The ship loader/unloader operator, as applicable.

.3 Ship's master, chief officer and crew.

.4 Know the standard procedures and plans by which bulk carriers are loaded and unloaded.

.5 Know the ship/shore communications and emergency procedures applicable.

.6 Know how to access and work safely on board a bulk carrier.

.7 Understand and know how to safely start up, operate and shut down the ship loading/unloading equipment on the terminal for which they are responsible. (See annex 4.)

.8 Terminal personnel should be knowledgeable of their responsibilities under other relevant codes for example the ISPS Code (International Ship and Port Facility Security Code), IMO/ILO Code of Practice on Security in Ports and the ILO Code of Practice on Safety and Health in Ports.

2.3.4 Terminal operators should ensure that personnel involved in the loading and unloading operations are duly rested to avoid fatigue.

2.3.4 In addition to assuring that terminal personnel are duly rested, terminal personnel involved in cargo handling work should be provided with personal protective equipment such as safety helmets, safety footwear, high visibility jackets, gloves, hearing and respiratory protection, as required.

Section 3
Procedures between ship and shore prior to ship's arrival

3.1 Information exchange: general

3.1.1 It is important that the ship be provided with information about a terminal so the loading or unloading can be planned. Similarly, the terminal will need information about the ship to enable preparations to be made to load or unload the ship. It is important that the information be exchanged in sufficient time to allow preparations to be made.

3.1.1 (See annex 1.)

3.1.2 Before loading commences there should be an agreement between the master and the terminal representative as to the rate of loading and order in which the cargo is to be distributed so as to achieve the final loading plan. In general, this agreement should be based on one or more of the following options:

.1 the limitations or restrictions on loading procedures, if such are specified in the ship's loading manual or trim and stability booklet, or both;

.2 if the restrictions mentioned in .1 do not exist, and the ship has a loading instrument which has been approved, the loading plan should be prepared on the instrument and there should be a protocol in place so that the loading remains, at all times, within the approved stress limits of the ship; and/or

.3 if neither .1 or .2 can be satisfied, then a conservative procedure should be followed.

3.1.2 The master should forward the proposed loading/unloading plan to the terminal before the ship arrives:

.1 The terminal representative should check the plan and ensure it corresponds to its expectations. If it does not, the terminal may revert to the ship requesting a review of the proposed plan.

.2 By giving the ship adequate time to prepare an alternative plan, in compliance with the ship's stability booklet and loading manual or instrument, it should be possible to identify a mutually acceptable loading sequence.

.3 However, even where the load plan is not the terminal's preferred option, the terminal representative should co-ordinate and agree to a plan before starting operations. Operations should not start until agreement has been obtained.

3.1.3 Details should be provided of any necessary repairs which may delay berthing, the commencement of loading or unloading, or may delay the ship sailing on completion of loading or unloading.

3.1.3 The terminal should be informed if any proposed visits by ship repair contractors or service personnel, or if cranes or other equipment are required on the jetty.

3.1.4 The master should ensure he receives from the shipper of the intended cargo, details of the nature of the cargo required by chapter VI of SOLAS 1974, as amended.* Where additional details, such as trimming or continuous measurement of the water in the cargo, etc., are required, the master should inform the terminal accordingly.

3.1.4 Before commencement of loading of a solid bulk cargo, the shipper must provide the master with the characteristics and properties of the cargo, including:

.1 Stowage factor, angle of repose, trimming procedures, and likelihood of shifting.

.2 The transportable moisture limit and average moisture content in the case of a concentrate or other cargo which may liquefy.

.3 Flammability, toxicity, corrosiveness, chemical, oxygen depletion and any other hazards of the cargo, as applicable.

3.1.5 The terminal representative should verify that the master has received the relevant cargo declaration form information, as applicable, in good time. (See BLU Code – appendix 5.)

* Refer to MSC/Circ.663 and to the form for cargo information, which is set out in appendix 5 to the BLU Code.

3.1.6 The master should inform the terminal representative of any particular precautions to be taken with the loading or unloading of the cargo.

3.2 Information given by the ship to the terminal

3.2.1 In order to plan the proper disposition and availability of the cargo so as to meet the ship's loading plan, the loading terminal should be given the following information:

.1 The ship's estimated time of arrival (ETA) off the port as early as possible. This advice should be updated as appropriate.

.2 At the time of initial ETA advice, the ship should also provide details of the following:

.2.1 name, call sign, IMO Number of the ship, its flag State and port of registry;

.2.2 a loading plan stating the quantity of cargo required, stowage by hatches, loading order and the quantity to be loaded in each pour, provided the ship has sufficient information to be able to prepare such a plan;

.2.3 arrival and departure draughts;

.2.4 time required for deballasting;

.2.5 the ship's length overall, beam, and length of the cargo area from the forward coaming of the forwardmost hatch to the after coaming of the aftmost hatch into which cargo is to be loaded or from which cargo is to be removed;

.2.6 distance from the waterline to the first hatch to be loaded or unloaded and the distance from the ship's side to the hatch opening;

.2.7 the location of the ship's accommodation ladder;

.2.8 air draught;

.2.9 details and capacities of ship's cargo handling gear;

.2.10 number and type of mooring lines; and

.2.11 any other item related to the ship requested by the terminal.

.3 Similar information in respect of ETA, unloading plan and details of the ship are required by unloading terminals.

3.2.1 See example of pre-arrival exchange of information checklist (annex 1).

.1 It is important that the terminal receives updated ETAs.

.2 Notifying the terminal of the proposed loading or unloading plan well in advance of arrival gives the terminal the opportunity to check that the information on which it is based is correct. For example, a plan may be based on a terminal having two loaders/unloaders where there is actually only one available. It also allows the terminal to check the plan against its preferred rotation, and to request a modification.

.3 The master then has the opportunity to recalculate the plan and clarify any questions so that a safe, correct and mutually acceptable plan is agreed preferably before the ship berths.

.4 If the terminal's suggested plan is unsuitable for the ship, and does not meet its stability and hull stress criteria, then the terminal representative and master should co-ordinate and agree on a plan before operations begin.

.5 Other items of information requested by the terminal may include:

.5.1 Confirmation that ballast water is clean seawater ballast.

.5.2 Any ship defects which could affect operations.

.5.3 Ship's operational and navigational equipment safety status.

.5.4 Details of any planned bunkering and storing operations, or repairs to be carried out.

.5.5 Ballast handling rates.

.6 Terminals should require both a cargo stowage plan and a plan indicating the order of loading/unloading and the quantity to be loaded/unloaded into/from each hold.

3.2.2 Ships arriving at loading or unloading terminals in a part loaded condition should also advise:

.1 berthing displacement and draughts;

.2 previous loading or unloading port;

.3 nature and stowage of cargo already on board and, when solid bulk cargoes are on board, the Bulk Cargo Shipping Name (BCSN), the IMSBC Code Class and UN Number, when applicable;

.4 distribution of cargo on board, indicating that to be unloaded and that to remain on board.

3.2.2 Ships should provide the terminal with a loading or unloading plan stating the cargo distribution plan for the cargo to be loaded/unloaded, the hold rotation and quantities to be loaded/unloaded per run.

3.2.3 Combination carriers (OBO or O/O) should advise of the following additional information:

.1 nature of the preceding three cargoes;

.2 date and place at which the last oil cargo was discharged;

.3 advice as to content of slop tanks and whether fully inerted and sealed; and

.4 date, place and name of authority that issued the last gas-free certificate which includes pipelines and pumps.*

3.2.3 During the unloading of dry bulk cargo it may be necessary to ballast one or more holds to reduce the cargo air draught of the ship. This is unlikely to introduce hazards if the pipeline system has been well washed. However, if a pump or pipeline has not been adequately washed, the ballasting operation may discharge residual oil into the hold. Atmospheric tests in the hold should therefore be made before any hot work is carried out in, adjacent to, or above a ballasted hold.

3.2.4 As soon as possible the ship should confirm that all holds into which cargo is to be loaded are clean, and free from previous cargo residues which in combination with the cargo to be loaded could create a hazard.

3.2.5 Information on the loading or unloading plan and on intended arrival and departure draughts should be progressively updated, and passed to the terminal as circumstances change.

* Refer to the chapter for combination carriers in the *International Safety Guide for Oil Tankers and Terminals (ISGOTT)* and in particular to the section on cargo changeover checklists and the section on discharge of bulk cargoes.

3.3 Information given by the terminal to the ship

3.3.1 On receipt of the ship's initial notification of its ETA, the terminal should give the ship the following information as soon as possible:

.1 the name of the berth at which loading or unloading will take place and the estimated times for berthing and completion of loading or unloading;

.2 characteristics of the loading or unloading equipment, including the terminal's nominal loading or unloading rate and the number of loading or unloading heads to be used;

.3 features of the berth or jetty the master may need to be aware of, including the position of fixed and mobile obstructions, fenders, bollards and mooring arrangements;

.4 minimum depth of water alongside the berth and in approach or departure channels;

.5 water density at the berth;

.6 the maximum distance between the waterline and the top of cargo hatch covers or coamings, whichever is relevant to the loading operation, and the maximum air draught;

.7 arrangements for gangways and access;

.8 which side of the ship is to be alongside the berth;

.9 maximum allowable speed of approach to the jetty and availability of tugs, their type and bollard pull;

.10 the loading sequence for different parcels of cargo, and any other restrictions if it is not possible to take the cargo in any order or any hold to suit the ship;

.11 any properties of the cargo to be loaded which may present a hazard when placed in contact with cargo or residues on board;

.12 advance information on the proposed cargo handling operations or changes to existing plans for cargo handling;

.13 if the terminal's loading or unloading equipment is fixed, or has any limits to its movement;

.14 mooring lines required;

.15 warning of unusual mooring arrangements;

.16 any restrictions on deballasting;

.17 maximum sailing draught permitted by the port authority; and

.18 any other items related to the terminal requested by the master.

3.3.1 The terminal should furnish as applicable:
(See example of pre-arrival ship/shore exchange of information (annex 1).)

.1 The expected maximum and average loading/unloading rates may be discussed and clarified during completion of the ship/shore checklist at the arrival meeting between the terminal representative and the master.

.2 Information regarding draught survey requirements where applicable.

.3 Information regarding any draught surveys to be carried out, usually requesting ballast tanks to be either full or empty, containing clean seawater ballast where possible.

.4 Usual anchorage and pilot embarkation area.

.5 Whether ships may berth/depart at any time, or if it is necessary to wait for certain tidal conditions.

.6 If ship or shore gangway is to be used, clarification of responsibility for ensuring that it is maintained in a safe manner throughout the ship's stay in port.

.7 Information on precautions regarding strong tides or currents, swell, "stand-off" effect at piled jetties, passing traffic, or high winds.

.8 Arrangements for immobilization of ship's engines alongside.

.9 Information on the characteristics and properties of the cargo to be loaded.

3.3.2 Information on estimated times for berthing and departure and on minimum water depth at the berth should be progressively updated and passed to the master on receipt of successive ETA advices.

3.3.3 The terminal representative should be satisfied that the ship has been advised as early as possible of the information contained in the cargo declaration as required by chapter VI of SOLAS 1974, as amended.

3.3.3 The shipper of the cargo is responsible for ensuring that this information is provided to the master in good time.

Section 4

Procedures between the ship and the terminal, prior to cargo loading/unloading

4.1 Principles

4.1.1 The master is responsible at all times for the safe loading and unloading of the ship, the details of which should be confirmed to the terminal representative in the form of a loading or unloading plan. In addition, the master should:

.1 ensure that the checklist in appendix 3 is completed in consultation with the terminal before loading or unloading is commenced;

.2 ensure that the loading or unloading of cargo and the discharge or intake of ballast water is under the control of the ship's officer in charge;

.3 ensure that the disposition of cargo and ballast water is monitored throughout the loading or unloading process to ensure that the ship's structure is not overstressed;

.4 ensure that the terminal representative is made aware of the requirements for harmonization between deballasting and cargo loading rates for his ship;

.5 ensure that ballast water is discharged at rates which conform to the agreed loading plan and do not result in flooding of the quay or of adjacent craft;

.6 retain on board sufficient officers and crew to attend to the adjustment of mooring lines or for any normal or emergency situation, having regard to the need of the crew to have sufficient rest periods to avoid fatigue;

.7 ensure the loading or unloading plans have been passed to and agreed with the terminal representative;

.8 ensure that the terminal representative is made aware of the cargo trimming requirements;

.9 ensure that appropriate information about the cargo to be loaded (appendix 5) has been received to enable safe stowage and carriage to be achieved;

.10 ensure that there is agreement between ship and shore as to the action to be taken in the event of rain, or other change in the weather, when the nature of the cargo would pose a hazard in the event of such a change; and

.11 ensure that no hot work is carried out on board the ship while the ship is alongside the berth except with the permission of the terminal representative and in accordance with any requirements of the port administration.

4.1.1 The loading/unloading plan should preferably be agreed in principle prior to the arrival of the ship.

.1 The terminal representative should ensure the loader/unloader operators and/or terminal control room personnel receive a copy of the agreed load/unload plan. They should also be immediately notified of any subsequently agreed changes. Copies should be retained in the terminal's file for that ship.

.2 The total quantity to be kept for trimming should be clearly stated in the loading plan.

.3 The quantity remaining on the belt should be accurately known, or else the belts should run off before trimming commences.

.4 Where loading terminals insert empty gaps into the flow of material to allow for changing hatches, these gaps should be adequate and there should be good communications between loader and stockyard to ensure the loader can move safely.

.5 For multi-unloader or loader operations the terminal should inform the master of its procedures for preventing collisions between the loaders/unloaders. The cargo plans should normally ensure that the machines will be separated by at least one unworked hatch.

.6 The actual quantities to be trimmed should be determined by the master in good time as loading completes, and the

distribution clearly specified to the terminal representative and to the loader operator.

.7 Due allowance should be made for the belt run off on completion.

.8 Where load/unload plans are programmed into the computerized control system of loader/unloaders, the operator should monitor these carefully, keep the programme updated as the operation progresses, double check if doubt, and be able to revert to a manual tally in event of any problems with the computer programme.

.9 The terminal representative should notify the master when cargo conditions have changed due to weather.

4.1.2 The terminal representative is responsible for loading or unloading cargo in accordance with the hatch sequence and tonnages stated on the ship's loading or unloading plan. In addition, the terminal representative should:

.1 complete the checklist in appendix 3 in consultation with the master before loading or unloading is commenced;

.2 not deviate from the loading or unloading plan unless by prior consultation and agreement with the master;

.3 trim the cargo, when loading or unloading, to the master's requirements;

.4 maintain a record of the weight and disposition of the cargo loaded or unloaded and ensure that the weights in the hold do not deviate from the plan;

.5 provide the master with the names and procedures for contacting the terminal personnel or shipper's agent who will have responsibility for the loading or unloading operation and with whom the master will have contact;

.6 avoid damage to the ship by the loading or unloading equipment and inform the master, if damage occurs;

.7 ensure that no hot work is carried out on board or in the vicinity of the ship while the ship is alongside the berth except with the permission of the master and in accordance with any requirements of the port administration; and

.8 ensure that there is agreement between the master and the terminal representative at all stages and in relation to all aspects of the loading or unloading operation.

4.1.2 The terminal representative responsible for loading or unloading cargo should:

.1 Inform the ship of all relevant information regarding:

.1.1 Cargo operations.

.1.2 Ship and terminal safety issues and regulations.

.1.3 Arrangements for safe access to/from the ship.

.1.4 Arrangements for access for crew members through the terminal premises.

.1.5 Weather and tidal conditions.

.1.6 Mooring management recommendations.

.2 Understand and respond to the information provided by the master regarding particular safety and operational issues of concern to the ship.

.3 Have sufficient personnel available to deal with any emergencies likely to affect the safety of its personnel and facilities.

.4 Have details to be specified in the ship/shore checklist, and should also be provided with the terminal's regulations and information booklet.

.5 Have a procedure for checking the origin, nature and extent of damage whether notified by terminal or ship personnel.

.6 Have knowledge of hot work procedures to identify any risks, and be familiar with the control measures and precautions required, noting that it may be necessary to ballast one or more holds to reduce the cargo air draught of the ship. With combination carriers, this is unlikely to introduce hazards if the pipeline system has been well washed. However if a pump or pipeline has not been adequately washed, the ballasting operation may discharge residual oil into the hold. Atmospheric tests in the hold should therefore be made before any hot work is carried out in, adjacent to, or above a ballasted hold.

4.2 Procedures

4.2.1 The following are considered important procedures in respect of cargo loading:

.1 the master and terminal representative should indicate agreement to the loading plan before commencement of loading by signing the plan in the spaces provided;

.2 the master should state on the agreed loading plan, the order in which the holds are to be loaded, the weight of each pour, the total weight in each hold and the amount of cargo for vessel trimming purposes, if required;

.3 the terminal representative, on receipt of the ship's initial loading plan (see 3.2.1), should advise the master of the nominal loading rate at which the ship may expect to receive the cargo and the estimated time required to complete each pour;

.4 where it is not practical for the ship to completely discharge its ballast water prior to reaching the trimming stage in the loading process, the master and the terminal representative should agree on the times at which loading may need to be suspended and the duration of such suspensions;

.5 the loading plan should be prepared so as to ensure that all ballast pumping rates and loading rates are considered carefully to avoid overstressing the hull;

.6 the quantities of cargo required to achieve the departure draught and trim should allow for all cargo on the terminal's conveyor systems to be run off and empty on completion of a loading. The terminal representative should advise the master of the nominal tonnage contained on its conveyor system and any requirements for clearing the conveyor system on completion of loading; and

.7 communication arrangements between the ship and terminal should be capable of responding to requests for information on the loading process and of prompt compliance in the event that the master or terminal representative orders loading to be suspended. Consideration should be given to the disposition of cargo on the conveyor systems and to the response time in the event of an emergency stop.

4.2.1 It is the master's responsibility to ensure the loading plan is prepared in accordance with the ship's loading manual.

.1 For each step of the loading operation the loading plan should also show the amount of ballast and the tanks to be deballasted, the ship's draught and trim, and the calculated shear stress and bending moments.

.2 The master should carry out draught checks at regular intervals during the loading, and particularly when between about 75–90% of the cargo is loaded. The tonnage loaded should be compared with the terminal's weight figure, and adjustments to the final trimming figures determined and agreed accordingly.

.3 Any changes to the loading plan required by either terminal or ship should be made known as soon as possible and agreed by the master and terminal representative. Stresses resulting from any changes must remain within the ship's hull stress limitations.

.4 High impact cargo drops and exceeding maximum load limits on tanks tops should be avoided.

.5 To avoid over-stressing the ship:

.5.1 Cargo should be distributed evenly within each hold and trimmed to the boundaries of the cargo space to minimize the risk of it shifting at sea.

.5.2 Cargo should not be loaded high against one hold bulkhead on one side, and low against the other.

.5.3 Each hold should be loaded using at least two separate pours per hold.

.5.4 The terminal should maintain an accurate record of the tonnages loaded in each pour into each hold.

.5.5 Sudden increases in the loading rates causing significant overloading should be avoided.

.6 The amount of cargo remaining on the belts depends on the loading rate at the time. This should be known by the loader operator and the terminal representative.

.7 Ship/shore communications arrangements should be confirmed when completing the ship/shore safety checklist,

giving all necessary details and contact details for both ship and terminal including:

.7.1 Language and terminology to be used.

.7.2 Location of telephones and terminal offices, normal communications procedures and telephone numbers.

.7.3 Emergency communications procedures and telephone numbers.

.7.4 Designated port VHF channels.

.8 Clarify procedures for providing the duty officer with the tonnage loaded and the loading rate as required.

.9 Clarify arrangements for stops to carry out draught checks.

.10 Clarify arrangements for reporting ship damage by stevedores.

4.2.2 The following are considered important procedures in respect of cargo unloading:

.1 the terminal representative, when proposing or accepting the initial unloading plan, should advise the master of the nominal unloading rate and the estimated time required for each stage of the discharge;

.2 the master should advise the hold order and the weight to be unloaded at each stage of the discharge;

.3 the terminal representative should give the ship the maximum warning when it is intended to increase, or to reduce, the number of unloading heads used; and

.4 communication arrangements between ship and terminal should be capable of responding to requests for information on the unloading process, and of prompt compliance in the event that the master orders unloading to be suspended.

4.2.2 The ship should provide the terminal with its proposed unloading plan in advance of the ship's arrival.

4.2.3 The terminal representative should co-ordinate with the master and agree upon a plan before operations begin.

4.2.4 Agreeing the unloading plan prior to arrival simplifies matters for all concerned when the ship does arrive, as there usually is little time for

the master to recalculate the unloading plan after the ship has arrived and is ready to commence unloading.

.1 The master should ensure that the terminal representative is provided with accurate information in good time so that the loader/unloader operator can be notified of the ship's requirements.

4.3 Implementation

4.3.1 The loading or unloading plan should be prepared in a form such as that shown in appendix 2. Worked examples of this form are also shown in appendix 2. A different form may be used, provided it contains the essential information to meet the requirements of this Code. The minimum information for this purpose is that enclosed in the heavy line box on the sample form.

4.3.2 The loading or unloading plan should only be changed when a revised plan has been prepared, accepted and signed by both parties. Loading plans should be kept by the ship and terminal for a period of six months.

4.3.3 A copy of the agreed loading or unloading plan and any subsequent amendments to it should be lodged with the appropriate authority of the port State.

4.3.3 Records should be maintained in accordance with any national requirements.

Section 5
Cargo loading and handling of ballast

5.1 General

5.1.1 When the cargo loading plan is agreed, the master and terminal representative should confirm the method of cargo operations so as to ensure no excessive stresses on the hull, tank top and associated structures, and exchange information to avoid any structural damage to the ship by cargo-handling equipment.

5.1.1 For guidance on avoidance of damage during cargo handling, see annex 2.

5.1.2 The terminal representative should alert the master, when the cargo is heavy, or when the individual grab loads are large, that there may be high, localized impact loads on the ship's structure until the tank top is completely covered by cargo, especially when high free-fall drops are permitted. As such impacts have the potential for causing structural damage, special care should be taken at the start of the loading operation in each cargo hold.

5.1.2 Special care needs to be taken with heavy cargoes such as iron ore, scrap iron, lead and other concentrates.

.1 The loader chute, spout or grab should be kept as close to the tank top as possible and loading should be started at a low rate until the tank top in the loading area is covered with a layer of cargo. As the pile builds up on that area the cargo will roll down the pile and slowly spread over the rest of the tank top without any heavy impact.

5.1.3 Monitoring of the cargo handling operation, and effective communication between the terminal and ship, must be maintained at all times, and especially during final trimming of the ship.

5.1.3 Communications may be maintained by all or any of the following:

.1 Direct verbal contact between the designated ship's officer and the terminal representative.

.2 Portable radio communication between designated officer, terminal representative and/or loader operator.

.3 Telephone and/or easily accessible talk-back speakers on loader structure to allow surveyor/designated ship's officer/ terminal representative to speak directly with loader operator during trimming operations.

5.1.4 Any requirement for cargo trimming should be in accordance with the procedures of the IMSBC Code, or the International Grain Code, as appropriate.

5.1.4 The master, the terminal representative and the loader operators at the load port should bear the unloading of the cargo in mind while they are loading the ship. They should, where possible, avoid trimming cargo onto beams or ledges from where it will be difficult or unsafe to remove.

5.1.5 In order to effectively monitor the progress of the cargo loading operation it is essential for both the master and terminal representative to have readily accessible information on the total quantity loaded, as well as the quantities per pour.

5.1.5 Trimming pours:

.1 The loading belts should be run empty before the 90% survey if there is any doubt about the quantity of cargo remaining on them.

.2 Where applicable, scale weights should be checked against the draught survey estimates of cargo loaded and cargo remaining to be loaded, and allowances made for the balance to be loaded.

.3 The quantity of cargo to be trimmed into the fore and aft holds should be delivered exactly as required to ensure the ship finishes with the required fore and aft draughts and trim. This will ensure it will be able to depart from the load port and proceed to and arrive at its unloading port safely and with the required under-keel clearance.

5.1.6 On completion of loading, the master and the terminal representative should agree in writing that the ship has been loaded in accordance with the loading plan, including any agreed variations.

5.1.6 The ship's agent should assist in preparing the necessary documentation on completion of loading.

5.2 Ship duties

5.2.1 The master should advise the terminal representative of any deviation from the deballasting plan or any other matter which may affect cargo loading.

5.2.1 If the ship cannot deballast at the rate agreed in the loading plan, or if deballasting is causing the ship to list or trim incorrectly, the terminal representative should be informed in good time and arrangements made for the suspension of loading until the ship has resolved the problem.

5.2.2 The ship should be kept upright or, if a list is required for operational reasons, it should be kept as small as possible.

5.2.3 The master should ensure close supervision of the loading operation and of the ship during final stages of loading. The master should advise the terminal representative when final trimming of the ship has to commence in order to allow for the conveyor system run-off.

5.2.3 It is prudent that a draught survey is carried out with about 90% of the cargo loaded.

5.3 Terminal duties

5.3.1 The terminal representative should advise the master on any change to the agreed loading rate and, at the completion of each pour, the terminal representative should advise the master of the weight loaded and that cargo loading continues in accordance with the agreed cargo plan.

5.3.1 The weight of the cargo being loaded should be harmonized with the ballast water being pumped out, so that both remain in step.

.1 The rate of loading into the holds should be maintained at a steady flow. The ship should be informed of any changes.

.2 The load plan is normally designed to maintain the ship with a slight trim by the stern in order to strip out the ballast.

5.3.2 The ship should be kept upright with the cargo distributed so as to eliminate any twisting of the ship's structure.

5.3.2 The ship should also ensure that the ballast is discharged in accordance with the loading/unloading plan.

5.3.3 The terminal should use weight meters which are well maintained and provide an accuracy to within 1% of the rated quantity required over the normal range of loading rates. The terminal should frequently monitor the weight of cargo that is being loaded and inform the ship so that it can be compared with the cargo loading plan and the ship's calculation by draught marks.

5.3.3 A one per cent error on a 70,000 tonne cargo is 700 tonnes.

.1 If the weigh scale is reading lower than the actual tonnage loaded, then the scale will be reading 69,300 tonnes when there is 70,000 tonnes on board. If no allowance is made for this, then it may not be possible to complete the trimming of the ship as per cargo plan.

.2 The terminal should co-operate with the master in carrying out the 90% draught survey and determining any weight meter error. Due allowance should then be made when loading the remaining balance of cargo.

Section 6
Unloading cargo and handling of ballast

6.1 General

6.1.1 When the cargo unloading plan is agreed, the master and terminal representative must confirm the method of cargo operations so as to ensure no excessive stresses on the hull, tank top and associated structures, including any measures to reduce and eliminate any structural damage to the ship by cargo handling equipment.

6.1.1 In addition to the avoidance of structural damage to the ship, the health and safety of ship and shore personnel should not be compromised by the adoption of any unloading practice.

.1 If the ship cannot be unloaded safely by the normal unloading methods due to design features of the particular ship or the way in which the cargo was loaded, then the master and terminal representative should carry out a risk assessment to identify a safe system of work.

.2 Safety issues to be considered include:

.2.1 Safe access for shore personnel; gangways should be secure with safety net fitted, adequately illuminated and with safe access from top of gangway to the deck.

.2.2 Access on deck to be confined to the outboard side only. There should be no access for anyone on the inboard side of the ship where unloading equipment is working overhead.

.2.3 Hold access ladders should be safe, secure and in good condition.

.2.4 Hold access trunks should be adequately lit.

.2.5 Adequate hold lighting. Holds cannot be cleaned properly and personnel cannot work safely if the lighting provided by the ship is inadequate.

.2.6 Adequate ventilation of holds.

.2.7 The risk of overhanging cargo that could fall on personnel working underneath.

.2.8 Provision of safe access to cargo residue requires manual removal from ship's frames, pipes and structures.

.2.9 Arrangements regarding ship's crew entering holds, or lowering clean-up tools/equipment into holds while shore personnel are still working there.

.2.10 Arrangements for safe access to and erection of guard railings around hatch covers, where shore personnel have to remove spillage from top of hatch covers.

.2.11 Ship's crew to ensure that hatch covers are fully opened clear of the line of the hatch coaming and secured in position, so that grab ropes/shackles cannot catch on overhanging lips.

.2.12 Geared ships to have gear swung outboard and lowered as much as possible below the unloader gantry.

.2.13 Hold manhole covers and bilge cover plates should be secured flush with the tank top. Paint marks on the bulkhead indicating their position are useful to machine drivers.

.2.14 All personnel should keep well clear of the area where the unloader is working.

.2.15 Respiratory protection should be worn by both ship and shore personnel when handling dusty cargo.

.2.16 Reporting of defects – any apparent deficiency or hazard that could affect the safety of unloading operations should in the first instance be reported to the master.

.2.17 All lifting appliances and lifting gear – whether provided by ship or terminal – should be used in a safe and proper manner, and have current test and examination certificates.

6.1.2 Monitoring and effective communication between the terminal and ship must be maintained at all times.

6.1.2 Contact details and procedures should be agreed and noted in the ship/shore safety checklist.

6.1.3 On completion of unloading, the master and the terminal representative should agree in writing that the ship has been unloaded in accordance with the agreed unloading plan, with the holds emptied and cleaned to the master's requirements, and should record any detected damage suffered by the ship.

6.1.3 Hold cleaning requirements are normally specified in the relevant charter party or contract of affreightment. The holds should be cleaned to the master's satisfaction in accordance with the contractual requirements.

.1 Where the ship's crew members have commenced cleaning the holds as the terminal completes unloading in each one, the terminal, when appropriate and in conformance with national regulations, should assist the ship in removing hold sweepings and unloading all the available cargo residue ashore.

6.1.4 In order to maintain an effective monitoring of the progress of the cargo unloading plan, it is essential for both the master and the terminal representative to have readily accessible information on the total unloaded quantity as well as on the quantities unloaded per hatch.

6.1.5 When ballasting one or more holds, master and terminal operator should take account of the possibility of the discharge of flammable vapours from the holds. Suitable precautions* should be taken before any hot work is permitted adjacent to or above that space.

6.1.5 This applies to combination carriers, where holds must be adequately ventilated to ensure that the atmosphere contains no flammable or noxious vapours, and is safe for personnel and heavy machinery to work. Ref: *ISGOTT (International Safety Guide for Oil Tankers and Terminals)* (chapter 12).

6.1.6 During the unloading of dry bulk cargo it may be necessary to ballast one or more holds to reduce the cargo air draught of the ship. This is unlikely to introduce hazards if the pipeline system has been well washed. However if a pump or pipeline has not been adequately washed, the ballasting operation may discharge residual oil into the hold. Atmospheric tests in the hold should therefore be made before any hot work is carried out in, adjacent to, or above a ballasted hold.

* Refer to the section on the operation of combination carriers in the *International Safety Guide for Oil Tankers and Terminals (ISGOTT)*.

6.2 Ship duties

6.2.1 The master will advise the terminal representative of any deviation from the ballasting plan or any other matter which may affect cargo unloading.

6.2.2 At the start and during all stages of unloading cargo, the master should ensure that frequent checks are made so that:

.1 cargo spaces and other enclosed spaces are well ventilated, and persons are allowed to enter them only after they have been declared safe for entry in accordance with the guidelines developed by the Organization;

.2 the cargo is being unloaded from each hold in accordance with the agreed unloading plan;

.3 the ballasting operation is proceeding in accordance with the agreed unloading plan;

.4 the ship is securely moored, and that weather conditions are being monitored and local weather forecasts obtained;

.5 the ship's draught is read regularly to monitor the progress of the unloading;

.6 the terminal representative is warned immediately if the unloading process has caused damage, has created a hazardous situation, or is likely to do so;

.7 the ship is kept upright, or, if a list is required for operational reasons, it is kept as small as possible; and

.8 the unloading of the port side closely matches that of the starboard side in the same hold to avoid twisting the ship.

6.2.2 Further guidance is contained in IMO Assembly resolution A.864(20), Recommendations for entering enclosed spaces aboard ships.

Special precautions should be taken and enclosed space entry procedures observed where there is a risk of an unsafe atmosphere in ship's holds, particularly where:

.1 The cargo has been fumigated *en passage*.

.2 The cargo has oxygen depleting characteristics.

.3 The cargo is liable to give off flammable or toxic vapours.

The terminal representative should be familiar with the IMSBC Code recommendations for the specific cargoes that the terminal handles, and also with the Material Safety Data Sheets (MSDS) for those materials. When employed on grain laden ships, the terminal representative should be familiar with the International Grain Code.

The terminal representative should ensure the master is made aware of:

.1 Any local tidal or current conditions at the berth that could affect the safe mooring of the ship.

.2 Details of any prevailing wind conditions that could affect the safety of operations.

.3 Any forecasts of extreme wind conditions.

.4 Limiting wind or tidal conditions for berthing/unberthing.

.5 Limiting wind conditions for loader/unloader operations.

.6 Other conditions affecting operations such as wave or swell conditions, visibility, electrical storms.

.7 The effects of either heavy rainfall or drought conditions on the berth or approach channels.

Appropriate safety precautions should be taken while reading ship's draughts, including:

.1 Safe access along jetty edge.

.2 Wearing appropriate personnel protective equipment (including but not limited to lifejacket, safety helmet, safety boots, high visibility clothing, respiratory protection, as necessary).

Hold inspections should be carried out as soon as unloading of a hold is completed and it is safe to enter.

Any stevedore damage reports should be presented to the terminal representative immediately to allow the claim to be verified and agreement reached with the master concerning the arrangements to be made for its repair.

The terminal representative should be informed if the ship is being listed due to the distribution of ballast, or if there are problems on board with pumping ballast.

6.2.3 The master should ensure close supervision of the final stages of the unloading, to ensure that all cargo is unloaded.

6.2.3 The master should also ensure that:

.1 Adequate and proper hold lighting is provided.

.2 Bilge cover plates are properly secured so that they cannot be accidentally dislodged during hold cleaning.

6.3 Terminal duties

6.3.1 The terminal representative should follow the agreed unloading plan and should consult with the master if there is a need to amend the plan.

6.3.1 See annex 5: Guidelines for unloading from the holds so as to minimize listing, twisting, stressing as a result of cargo handling.

6.3.2 The ship is to be kept upright or, if a list is required for operational reasons, it is to be kept as small as possible.

6.3.2 The cargo should be removed in a methodical pattern across the hold so that any listing to one side and then the other is kept small and is constantly being corrected.

6.3.3 The unloading of the port side closely matches that of the starboard side in the same hold, to avoid twisting the ship.

6.3.3 Where grab operations are carried out in automatic or semi-automatic mode the unloader operator should:

.1 Ensure the limits are set correctly for every hold.

.2 That both ship and unloader are monitored constantly for any deviation from these limits.

.3 That the pattern followed by the grab is systematic and even across the hold.

6.3.4 Unloading rates and sequences should not be altered by the terminal unless by prior consultation and agreement between the master and the terminal representative.

6.3.4 Where there is significant and unavoidable delays to the unloading, or a reduction in the expected rates due to breakdowns or problems with the terminal materials handling system, the master should be informed and the plan amended as necessary.

6.3.5 The terminal representative should advise the master when unloading is considered to be completed from each hold.

6.3.6 The terminal should make every effort to avoid damage to the ship when using unloading or hold cleaning equipment. If damage does occur, it should be reported to the master and, if necessary, repaired. If the damage could impair the structural capability or watertight integrity of the hull, or the ship's essential engineering systems, the Administration or an organization recognized by it and the appropriate authority of the port State should be informed, so that they can decide whether immediate repair is necessary or whether it can be deferred. In either case, the action taken, whether to carry out the repair or defer it, should be to the satisfaction of the Administration or an organization recognized by it and the appropriate authority of the port State. Where immediate repair is considered necessary, it should be carried out to the satisfaction of the master before the ship leaves the port.

6.3.6 The master should inspect each hold as soon as possible after the completion of unloading of cargo from the hold. Any damage found should be reported to the terminal representative immediately.

6.3.7 The terminal representative should monitor the weather conditions and provide the master with the forecast of any local adverse weather condition.

Annex 1

Pre-arrival ship/shore exchange of information

An example of a bulk carrier ship/shore exchange of information

The table below indicates only an example and format for the exchange of information. Terminals may require additional information, especially in the case of part-loaded ships and combination carriers (further details of information to be exchanged may be found in section 3 of the BLU Code). The table may be modified as appropriate by individual terminals.

Information to be provided by the master to the terminal in accordance with relevant IMO guidelines regarding the safe loading and unloading of bulk carriers.

	INFORMATION	RESPONSE
1	Ship name Call sign/IMO Number/Flag Port of registry	Name . . . . . . Call sign . . . . . . IMO No. . . . . . Flag . . . . . . Port of registry . . . . .
2	ETA sea pilots	Date . . . . . . Time . . . . .
3	Unloading plan/cargo distribution or loading plan	Please attach proposed plan
4	Arrival draughts and proposed departure draughts	Arrival: Forward . . . . . /Aft . . . . . Departure: Forward . . . . . /Aft . . . . .
5	Time required for ballasting/ deballasting	
6	Ship's LOA/beam/displacement/ working length from forward coaming of No. 1 hatch to aft coaming of aft hatch	LOA . . . . . metres Beam . . . . . metres Displacement . . . . . tonnes Working length . . . . . metres
7	Gangway If shore gangway is provided, can ship provide secure landing place, safety net and bulwark ladder?	

	INFORMATION	RESPONSE
8	Distance from waterline to hatch coaming	
9	Number and kind of mooring lines Number of enclosed fairleads foreward and aft	
10	Trimming requirements	

Example of checklist to show suitability for loading/unloading solid bulk cargoes

		Master's Comments
1	Cargo holds and hatch openings are suitable for cargo operations	
2	Holds are clearly numbered on hatch covers/coamings	
3	Hatch covers, hatch operating systems and safety devices are in good operational condition	
4	List indication lights, if fitted, have been tested prior to arrival and are operational	
5	If applicable, loading instrument is certified and operational	
6	Propulsion/auxiliary machinery is in good operational order	
7	Mooring equipment is in good functional order	
	Signed: Master	Date:

Example of information to be provided by the terminal to the master in accordance with relevant IMO guidelines regarding the safe loading and unloading of bulk carriers

This may be modified as appropriate by individual terminals.

	INFORMATION	RESPONSE
1 1.1 1.2	Name of berth to be used Which side alongside Estimated time of berthing Estimated time of completion	No. 1 berth: . . . . . . No. 2 berth: . . . . . . 1. Berthing time . . . . . . 2. Estimated completion time . . . . .
2	Unloading equipment	1. Number of unloaders . . . . . . 2. Nominal rate . . . . . . 3. Estimated times for each stage of unloading to be agreed on arrival. 4. Cargo air draught of unloaders . . . . .
2.1	Loading equipment	1. Number of loaders . . . . . . 2. Expected rate No. 1 berth: . . . . . . 3. Expected rate No. 2 berth: . . . . . . 4. Estimated times for each stage of loading to be agreed on arrival. 5. Cargo air draught of loaders . . . . .
3 3.1	Minimum depth of water alongside Water density	No. 1 berth: . . . . . m No. 2 berth: . . . . . m Ships arriving on max. draughts to plan unloading so ship raises on even keel for first 12 hours. Depending on tide and weather.
4	Depths in approach and departure channels	Adequate at all times for all ships. Berthing times restricted as follows: No. 1 berth . . . . . . No. 2 berth . . . . .
4.1	Maximum allowable docking speed	. . . . . m/s
5	Pilotage anchorage (Pilot station VHF)	Pilots normally board at . . . . . . Ships awaiting a berth normally proceed direct to the . . . . . anchorage
6	Maximum distance from waterline to top of hatch coaming	Ships loading: . . . . . m Ships unloading: . . . . . m
7	Arrangements for gangways and access	

	INFORMATION	RESPONSE
8	Tugs:	Number available: . . . . . Number normally required: . . . . . type
8.1	Line boat available	Yes/No
9	Main engine immobilization alongside	No. 1 berth: Immobilization permitted/not permitted No. 2 Berth: Immobilization permitted/not permitted
10	Grades of cargo to be loaded	Product A: . . . . . tonnes Stowage factor on loading . . . . . . Product B: . . . . . tonnes Stowage factor: . . . . . . Etc.
11	Any advance information on proposed loading/unloading operations	Draught survey: Ships arriving to load should preferably have ballast tanks either fully pressed up or empty. Slow deballasting: loading continues at normal rate until ship requests loading stop. 1. The terminal's preferred options are: . . . . .
11.1	1. Loading plan 2. Unloading plan	. . . . .
12	Travel limits of terminal equipment	Maximum working distance from forward end of No. 1 hatch to aft end of aft hatch: No. 1 berth unloader: . . . . . m No. 1 berth loader: . . . . . m No. 1 berth unloader: . . . . . m No. 1 berth loader: . . . . . m
13	Mooring arrangements	Number of headlines or sternlines/breasts/springs:
14	Unusual mooring requirements	
	Signed: Terminal representative	Date:

Annex 2

Avoidance of damage during cargo handling

The traditional design and configuration of single-side skin bulk carriers presents obstacles to safe and efficient cargo handling, especially discharge with grabs.

The usual types of damage that occur during grab discharge operations are grab and payloader damage in the holds, damage to hatch coamings and covers, and damage to deck fittings and equipment.

Grab damage in the holds can be classified into three categories:

1. Damage to ladders or coamings during free digging.
2. Damage to frames and hopper side during the second phase of digging.
3. Damage to the tank top during the third phase of digging.

	Procedure	Key point
1	Prevention of damage to ladders .1 When free digging the operator should: .1.1 Check for the location of sloping ladders with intermediate platforms extending into the hold space, check if it is going to the outboard or inboard side, and check for the location of platforms. .1.2 Check location of vertical ladders and look out for intermediate platforms. .1.3 Work carefully across each end of the hold in turn, keeping clear of the ladders until the cargo falls away and the handrails and intermediate platforms can be seen.	• Ladder may be buried under the cargo with only the top section visible. • Grab may topple over and strike the ladder, so make due allowances.

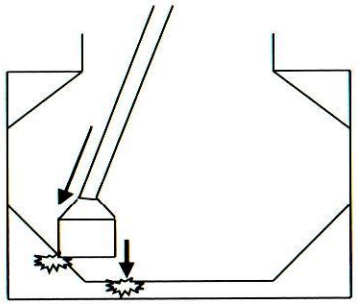
	Procedure	Key point
2	Prevention of damage to hoppers and sides frames during second phase .1 Grab evenly over the full area of the hold to avoid development of steep banks in the wings. .2 Do not pendulum swing the grab into the wings so that it could strike the ship's side shell frames. .3 Keep the grab straight and parallel to the ship's side. .4 Do not land the grab on the hopper side where bare steel is visible. .5 Do not attempt to land the grab close to the foreward and after bulkheads, as there may be an outward sloping stool plate under the cargo.	• Grab from the highest point of the cargo at all times. • Any damage to the frames may affect the seaworthiness of the ship, and has to be reported to the master. • Avoid swinging the grab in at an angle, as the corner of the grab may strike the hopper tank first. This will cause heavy indents or puncture holes in the tank plate. (See figures A & B)
3	Prevention of damage to inner bottom plating (tank top) – third phase .1 Lower the grab carefully and evenly onto the tank top. Never drop the grab at speed.	Be particularly careful where there are mounds of cargo on the tank top. One side of the grab will land safely on the cargo but the other side may drop corner-first onto bare steel. If it lands heavily it can puncture the tank top.

	Procedure	Key point
4	Prevention of damage to hatch coamings and covers .1 The operator should always check along the line of hatches that the covers are completely opened clear of the coaming. .2 The travel of the grab into the hold should be controlled so that the grab and the grab trolley are in line as the grab is moving out and down into the hold. This will ensure that the swing is under control at all times. .3 When working in the wings the grab trolley should be positioned so that the grab ropes and the grab itself are raised clear of the coaming.	This is caused by grab or rope contact with the coamings or covers. Ship's crew may: • Leave covers slightly closed over the top of the coaming to prevent spillage getting into the drain channels. • Fail to secure the open covers in place, which can allow them to roll closed. • Always be aware that the ship can move in or out, fore and aft, and up and down due to wind, tide, movement of cargo and ballast, or crew adjusting mooring ropes. • Raising or lowering the grab close to the coaming may result in the grab or the grab rope shackles catching on the lips of the hatch cover. This will result in the cover being lifted and dropped heavily, causing major damage to the coaming, the cover and the cover drive mechanism. • Damage to the cross-joint sealing arrangement could also occur.

	Procedure	Key point
5	Prevention of damage by payloader to bottoms of ladders, stool plates and bulkheads – fourth phase In co-ordination with the master, the operator should be informed of: .1 Location of the bottoms of ladders. .2 Location of any pipes or pipe guards. .3 Location of bilge cover plates.	• Payloader drivers should: Operate carefully around ladders and projections. Remove material manually where necessary. • Avoid grinding the corners of the payloader bucket along the bottom of the bulkheads and hopper tanks, as this kind of heavy pressure can cause unseen damage. • The master should point out the position of any obstructions on the tank top. On some ships the locations of bilge cover plates are marked by a line of paint on the bulkhead.
6	Prevention of damage to deck fittings and equipment Before travelling the unloader to a new location: .1 Check that the grab is well clear of all deck fittings and equipment before moving. .2 Check that it is clear for the unloader to move. .3 When working close to the bridge front or foremast make due allowances for aerials and other obstructions to the unloader boom and keep well clear.	Geared ships: • Derrick and crane jibs not in use should be lowered below the level of the unloader boom. • As the ship rises as the cargo is unloaded, the unloader operator should always check that there is safe clearance over all obstructions before attempting to move the unloader. The unloader boom should always be raised before moving if there is any doubt.

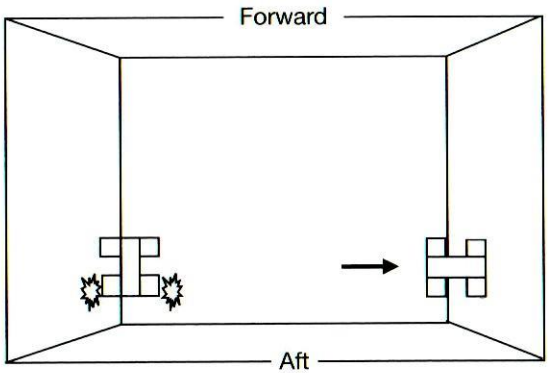
	Procedure	Key point
7	Error inducing conditions The following conditions may lead to operator error or misjudgement: .1 Overfilled or unevenly filled holds having ladders and platforms buried under the cargo. .2 Environmental conditions – poor lighting, dust, glare, fog. .3 Mechanical or control problems on the unloader – faulty grab controls, slipping winch brakes, slipping long travel brakes. .4 Poor working conditions such as poor conditions in the operator cab, faulty indicators, inadequate means of communications with ship and/or co-workers, faulty seat, dirty windows.	• Never grab from the forward and aft ends of the holds without being sure of where the ladders are. • Do not work unless the cargo in the hold is clearly visible. • All equipment faults should be reported to the terminal representative or relevant maintenance person immediately. • Unloader operations is a demanding job that requires concentration and care. Deficiencies and problems that distract the operator should be rectified immediately.

Figure A (Section view)



Sides of grab when "across-ship" increase the risk of point impact damage to hopper and tank top and this is more likely to happen when the grab is at an angle with the ship as it impacts with the hopper.

Figure B (Plan view)



Sides of grab when parallel to ship's side impact more evenly distributed on hopper, but pose more risk to stool plate.

Annex 3

Repair of damage incurred during loading and unloading

Guidelines for terminal representatives in responding to damage incidents

	Procedure	Key point
1	Reporting In consultation with the master, report the damage to the relevant authorities as described in the BLU Code.	
2	Inspection procedure .1 Inspect damaged area together with master. .2 Look for signs of fresh metal or freshly broken welds in the impact area. .3 Measure/estimate the damaged area, and length and depth of any indents. .4 Check for signs of previous damage, i.e., rusted broken welds or rusted indents.	Equipment required: Notebook, torch, camera, measuring tape.
3	Minor scrapes and indents .1 Photograph the required repair and estimate the cost. .2 Arrange for repairs if necessary, safe and practicable.	Alternatively agree a mutually acceptable means of resolving the issue with the ship's master. Ensure that such agreement is fully documented.
4	Damage to ladders, handrails and steps which cause safety problems. In consultation with the master and attending representative from the relevant authority, arrange for repairs to be carried out by a competent contractor.	

	Procedure	Key point
5	Serious damage This includes holes in tank tops or wing tanks, hatch coaming or hatch cover damage, or damage to decks or fittings essential to maintaining the seaworthiness of the ship. Repairs will have to be carried out in accordance with the requirements of the relevant authorities.	Normally the ship's Classification Society surveyor will be called in.
6	Requirements/Procedure In order to avoid or minimize any delays to the ship, the terminal or the specialist repair contractor should have: .1 Steel plate of suitable grade and size for ship repair available. .2 A list of qualified welders, with certificates available.	Plates of 12 mm, 16 mm, 18 mm, or 20 mm grade 50D (or BS 4360/43 D or E) steel, complete with relevant mill certificates will meet most requirements. Have a list of the type of welding rods used.
7	Work method Carry out the repair in accordance with the procedure and method specified by the surveyor. The following key points will normally have to be observed: .1 Ensure appropriate confined space entry and hot work procedures are followed before personnel begin any activities. .2 Where repair to a hatch cover is required, it should be positively secured in position, and the edges of the hatch cover cordoned off.	Have a competent person carry out an atmosphere test on the tank for explosive vapours/oxygen deficiency before doing any welding/ burning or tank entry. Ensure gas detector is properly calibrated.
8	Signing damage report forms All damage reports should be signed and acknowledged. .1 Where the damage is repaired, ensure the master provides appropriate documentation acknowledging that the repair was completed to his satisfaction. .2 If the damage cannot be repaired, duly note estimated cost on the form and attach signed notes of the agreement reached with the master for the completion of the repairs at another port or ship repair facility.	In event of claims for damage which did not occur at this terminal: Record in terms such as "in dispute, old damage, did not occur at this terminal". Acknowledge for "receipt only". Where major damage is concerned the terminal should appoint a competent independent surveyor to act on its behalf.

Annex 4

Training of terminal personnel involved in loading and/or unloading bulk carriers

Loader/unloader operator training should include:

1. The general hazards of loading and/or unloading bulk carriers (ref. *BLU Code (Code of Practice for the Safe Loading and Unloading of Bulk Carriers)*, the *International Maritime Solid Bulk Cargoes (IMSBC) Code* and the *International Grain Code*, as appropriate).

2. The dangerous effect improper loading and/or unloading can have on a ship.

Practical aspects to be included in the training should include:

- The BLU Code so that they understand and appreciate both the obligations it places on their terminal, and the limitations of the ships the terminal personnel are loading and/or unloading.
- The correct operating instructions for the ship loader or unloader they are operating.
- A basic understanding of the mechanical and electrical components of the loader and/or unloader such as travel drives, braking arrangements, ropes and rope care, grab/trolley winches, conveyors, operating and wind limits, storm anchoring.
- Emergency procedures such as fire on ship, terminal, or loader and/or unloader; mooring incidents, emergency stops.
- The correct techniques and patterns to be used to load or unload a ship, depending on the type of and number of loaders or unloaders being used.

To load a ship:

Loader operators should have an appropriate understanding of how to:

- Distribute the cargo in each hold in accordance with the agreed cargo plan to ensure the ship remains upright, and is neither stressed nor twisted.
- Ensure no hold is overloaded or overfilled, and that the ship can be safely trimmed on completion.

- Ensure loading efficiency is maximized, as per the agreed loading/deballasting plan.
- Ensure safety and environmental protection procedures are followed.

Ensure that good communications are maintained between the loader operator and the designated ship's officer, and between master and terminal representative.

To unload a ship:

Unloader operators should have an appropriate understanding of how to:

- Unload the cargo from each hold in accordance with the agreed unloading plan to ensure that the ship remains upright and is not stressed or twisted.
- Remove the cargo from the holds by either grab or continuous unloader in a manner that minimizes the risk of damage to the ship's structure.
- Ensure that good communications are maintained between the unloader operator and the designated ship's officer, and between master and terminal representative.
- Assess the risks arising from cargo sticking in frames and on hopper sides and facilitate, if possible, its safe removal without risk to the safety of terminal personnel and ship's crew members, or risk of damage to ship.

Terminal representative training

The terminal representative should:

1. Have a thorough understanding of the underlying principles related to the loading and/or unloading of bulk carriers as described in the BLU Code.

2. Know how to implement all aspects of the BLU Code.

3. Understand and manage the ship/shore interface in relation to the operations and limitations of the terminal, its cargo handling equipment and procedures, the planning, control and monitoring of cargoes, relevant properties of the cargoes being handled, berthing/mooring operations and emergency procedures.

The training, assessment and certification of trainees should be carried out by competent persons within the framework of existing training standards and national health and safety legislation.

Annex 5

Hazards

Terminal representatives should be aware that the following hazards may be encountered at the ship/shore interface during the loading and/or unloading of solid bulk cargoes.

Hazard	Possible sources or causes
Fall from heights	• Gangways – typical bulk carrier gangways are unsuitable and unsafe for use at many bulk terminals. • Inadequate fencing of open holds and dangerous edges. • Accessing/egressing ship's holds. • Removing cargo from stairs, ladders and side frames in ship's holds. • Working on top of hatch covers. • Weather conditions and tidal movements.
Moving equipment and vehicles	• Movement of ship loaders and/or unloaders. • Movement of mobile plant on terminal: – Payloaders, skid steer loaders, tractors and trailers – Cars, trucks and lorries – Cranes and lift trucks. • Operation of mobile plant in ships' holds. • Inadequate barriers at terminal edges where mobile plant is operating.

Hazard	Possible sources or causes
Falling objects	• Lifting and suspension of grabs. • Material falling from grabs. • Personnel on deck walking under the grab. • Lifting and suspension of mobile plant from terminal to ship and from hold to hold. • Lifting and suspension of loading chutes, spouts and arms. • Lifting and suspension of welding and other equipment into hold to carry out damage repairs. • Cargoes falling from ships' hold structures, frames, beams, ledges and ladders. • Personnel lowering or raising equipment in and out of holds with personnel still at work underneath. • Personnel monitoring cargo operations standing too close to where grab is working, and at risk of being struck by grab, or by a breaking grab rope.
Slips, trips and falls	• Wet or slippery surface from ice, cargo or oil spillage on ship or terminal. • Badly stowed ropes, hoses and equipment on ship or terminal. • Unmarked obstacles on ship's decks such as manhole covers, securing eyes, safety stanchion sockets. • Climbing and working on and around loose and unstable material in ship's holds. • Personnel handling ship's stores on terminal edge.
Fire or explosion	• Dust created by certain cargoes may constitute an explosion hazard. • Flammable gases emitted by certain bulk cargoes may give rise to a fire or explosion hazard. • Incompatible materials which may react dangerously. • Materials liable to spontaneous combustion. • Bunkering operations. • The use and refuelling of mobile plant in ships' holds. • Smoking and the use of naked flames. • Hot work. • Combination carriers including holds, pumps and pipelines not gas-free when unloading dry bulk, or with slop tanks or wing tanks not inerted.

Hazard	Possible sources or causes
Hazardous substances	• Dangerous goods. • Cargoes liable to oxidation, oxygen reduction and emission of toxic fumes, particularly when wet. • Cargoes corrosive to skin and eyes, and to ships' structures, particularly when wet. • Cargoes liable to cause oxygen depletion, e.g., metals, vegetable/fruit products, forest products. • Accumulation of dangerous gases in cargo spaces or in adjacent spaces. Failure to observe Confined Space Entry and Atmospheric Testing procedures.
Health hazards due to dust	• Dusty cargoes. • Spillage from loading and/or unloading equipment. • Incorrectly operated and/or maintained loading and/or unloading equipment causing excessive dusting. • Tipping and storage of cargo on terminal.
Strains and sprains	• Manual handling such as shovelling, scraping of cargo in ship's holds. • Operating mobile plant in ship's holds. • Operating grab unloaders and similar equipment. • Handling mooring lines.
Tidal movements and wind conditions	• Gangway becoming unsafe. • Collision between loader and/or unloader and ship's structure or gear. • Failure of unloader and/or loader braking system in high winds, leading to collision with ship. • Runaway of loader and/or unloader and/or transporter cranes in high winds.
Berthing and moving ships	• Collision between berthing ship and loader and/or unloader on terminal. • Breaking mooring lines – risk to personnel on ship and terminal from "snap-back" effect. • Passing ships.
Inadequately trained personnel	• Terminal, contractor or temporary employees assigned to work in terminal or on ship without adequate induction or job specific training. • Ship's personnel unfamiliar with the ship, or with the ship's operations.

Hazard	Possible sources or causes
Other activities that can occur on and around any terminal	• Failure of persons or organizations controlling different operations to co-operate in ensuring a safe place of work. For example, inadequate control of the activities of personnel, contractors, hauliers, visitors, other ships and port users.

Annex 6

Emergency procedures

Every terminal should always have written procedures for dealing with emergency situations. These should be summarized in the terminal's information and regulation booklet, and should be discussed by the terminal representative and the master of each ship on arrival.

Emergency situations that could occur should be assessed for each terminal, but typically should include:

1. Fire on board ship.

2. Fire on the terminal.

3. Oil spillage and pollution.

4. Injuries.

The emergency plans should include:

1. Alarm signals for terminal and for ship.

2. Notifying the emergency services, including necessary contact points and list of contact numbers.

3. Location of Muster Points.

4. Evacuation procedures.

5. First aid procedures.

6. Actions to be taken by both terminal and by ship in the event of:

- **.1** Fire or explosion on own ship, on another ship or terminal.
- **.2** Oil spillage.
- **.3** Ship breaking moorings.
- **.4** The necessity to rescue persons from holds, cranes or other plant.
- **.5** Other emergency.

7. Emergency communications procedures.

8. IMSBC Code Emergency Schedules (EmS) or Material Safety Data Sheets (MSDS) or for any materials possessing chemical hazards which are to be loaded or unloaded.

MSC.1/Circ.1357

Additional considerations for the safe loading of bulk carriers

1 The Maritime Safety Committee, at its eighty-seventh (12 to 21 May 2010) session, noted concerns that the provisions of SOLAS chapter VI, regulation 7 (Loading, unloading and stowage of solid bulk cargoes), and the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) are not being universally applied. In particular, the Committee noted that these concerns may be attributed to the lack of a mutual agreement between terminal representatives and masters on appropriate loading and unloading rates for solid bulk cargoes to prevent over-stressing of the ship's structure. In addition, the Committee noted that an agreed loading/unloading plan between the terminal representative and master is a mandatory requirement under SOLAS regulation VI/7.3.

2 The Committee recognized the need to provide further guidance to supplement the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) and agreed to the Additional considerations for the safe loading of bulk carriers, set out in the annex.

3 The Committee further noted IACS Recommendation No. 46, which provides relevant guidance and information on bulk cargo loading and discharging to reduce the likelihood of over-stressing the hull structure for bulk carriers.

4 The Committee urges Member Governments, terminal representatives, shipowners, ship operators, ship masters, ship charterers, shippers, receivers and other relevant parties to consider IACS Recommendation No. 46 and the annexed Additional considerations for the safe loading of bulk carriers when developing an agreed loading or unloading plan in accordance with SOLAS regulation VI/7 and the BLU Code (resolution A.862(20), as amended).

Annex

Additional considerations for the safe loading of bulk carriers

Introduction

1 SOLAS chapter VI, regulation 7.3 requires that before any solid bulk cargo is loaded or unloaded, the master and the terminal representative shall agree on a plan which shall ensure that the permissible forces and moments on the ship are not exceeded during loading and unloading. To facilitate the development of the plan, the Code of Practice for the Safe Loading and Unloading of Bulk Carriers (BLU Code) (resolution A862(20), as amended) is referenced.

2 The BLU Code requires co-operation and mutual agreement between the terminal representative and master with regard to how the ship is to be loaded and unloaded. The basic requirement of the Code is an agreed plan detailing the loading, unloading, ballasting and deballasting sequences. The preparation of a plan and maintaining control of the loading and unloading process in accordance with the plan and the BLU Code is fundamental to the safe loading of dry bulk cargoes.

3 The BLU Code also advises that charterers and shippers should allocate ships to terminals at which the ship will be capable of safely loading or unloading. Ships should be maintained in a sound, seaworthy condition and be free of defects that may prejudice the ships' safe loading, unloading or navigation. Terminal equipment should be properly certified, maintained and operated by duly qualified and, if appropriate, certificated personnel. All personnel, on board ships and in terminals, should be trained in all aspects of safe loading and unloading of bulk carriers commensurate with their responsibilities, including knowledge of the adverse effect that failure to comply with the agreed loading/unloading plan may have on the safety of the ship.

4 To supplement the BLU Code, guidance for terminal representatives and others involved in the handling of solid bulk cargoes is given in the Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives (MSC/Circ.1160, as amended).

5 This document is intended to provide further guidance for Member Governments, terminal representatives, shipowners, ship operators, ship masters, ship charterers, shippers, receivers and other relevant parties in the loading of bulk cargoes with the aim of supporting the safe operation of ships and terminals.

Time taken for loading

6 The total time to load and the nominal loading rate should be agreed to in advance of loading and should take into account the safe operational limits of the ship and the terminal. This agreement should be a part of the loading plan required under SOLAS, regulation VI/7.3, and should also be in line with the provisions of the BLU Code.

7 While a terminal may have a high nominal loading rate (the pour rate that can be achieved by the loading equipment), the total time taken for loading will also be influenced by the steps required to safely load a ship in order to keep the structural stresses within permissible limits.

Arrival condition

8 Arrival in port in a very lightly ballasted state should be avoided as such conditions can have detrimental consequences on manoeuvrability and structural strength. Manoeuvrability can be significantly affected by a large trim associated with a very light ballast condition, for example by increasing bodily drift and difficulty in swinging the ship in windy conditions, decreasing turning performance and increasing difficulty in maintaining the ship's course and position under the actions of wind and currents. In terms of hull structures, loading cargo in a shallow draught condition can impose high stresses in the double bottom, cross deck and transverse bulkhead structures if the cargo in the holds is not adequately supported by the buoyancy up thrust.

9 In developing the loading plan, and determining the arrival condition, consideration should be given to manoeuvrability issues and local loading criteria in the loading manual.

Loading sequences

10 The loading sequences should be agreed to in advance of loading and must take into account the safe operational limits of the ship and the terminal. This agreement should be a part of the loading plan required under SOLAS regulation VI/7.3, and should also be in line with the provisions of the BLU Code.

11 In developing loading sequences it should be noted that in general the stress range imposed on the ship can be reduced by increasing the number of pours.

12 It is recommended that the loading sequences consist of a minimum of two pours per hold plus two trim pours. When calculating the stresses at each step consideration may be given to using a margin (i.e., using less than 100% of the permissible limit) to allow for potential over runs or decoupling of ballast synchronization; providing time to stop loading operations, and subsequently take corrective action, while remaining within permissible limits.

During loading

13 Ballast operations need to be synchronized with loading operations as laid down and agreed in the loading plan required under SOLAS regulation VI/7.3. Ballast and loading operations should be carried out in a controlled manner in accordance with the loading plan and the provisions of BLU Code.

14 If at any time during loading the safe operational limits of the ship are exceeded, or likely to become so if the loading continues, the ship master has the right to suspend loading operations in order to take corrective actions (see SOLAS regulation VI/7.7).

Consequences of failure to apply BLU Code

15 Exceeding the permissible limits specified in the ship's approved loading manual will lead to over-stressing of the ship's structure and may result in catastrophic failure of the hull structure.

16 It is important to be aware that over-stressing of local structural members can occur even when the hull girder still water shear forces (SWSF) and bending moments (SWBM) are within their permissible limits. In this regard particular attention should be given to double bottom loading utilizing local loading diagrams in the loading manual.

17 If time for ensuring the cargo in each hold is trimmed (evenly distributed) is not included in the loading plan there is an increased risk of asymmetric loading. Asymmetric loading in the fore-aft direction can increase the lateral cargo pressure acting on the transverse bulkhead and increase the loads carried by the transverse bulkhead structure and the magnitude of transverse compressive stresses in the cross deck. Transverse asymmetric loading will introduce torsional loads leading to warping of the hull section giving rise to shearing and bending of the cross deck structure.

18 For more guidance please refer to IACS Recommendation No. 46 Guidance and Information on Bulk Cargo Loading and Discharging to Reduce the Likelihood of Over-stressing the Hull Structure.

References

19 International Maritime Organization (IMO), 4 Albert Embankment, London, SE1 7SR, United Kingdom.

The IMO Code of Practice for the Safe Loading and Unloading of Bulk Carriers, also known as the "BLU Code", as adopted by resolution A.862(20) and amended by resolution MSC.238(82).

The IMO Manual on Loading and Unloading of Solid Bulk Cargoes for Terminal Representatives, MSC/Circ.1160, as amended by MSC.1/Circ.1230.

IMO publications are available for purchase from www.imo.org.

20 International Association of Classification Societies (IACS), 36 Broadway, London, SW1H 0BH, United Kingdom.

IACS Recommendation No. 46: Guidance and Information on Bulk Cargo Loading and Discharging to Reduce the Likelihood of Over-stressing the Hull Structure, available for downloading from www.iacs.org.uk.