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GUIDELINES FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING HAZARDOUS LIQUID WASTES IN BULK FOR THE PURPOSE OF DUMPING AT SEA

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,

NOTING the increase in the number of ships engaged in the carriage of hazardous liquid wastes in bulk for the purpose of dumping at sea,

RECOGNIZING the need for the development of special guidelines for the construction and equipment of such ships to supplement the requirements of the International Convention for the Safety of Life at Sea, 1974,

HAVING CONSIDERED the recommendation made by the Maritime Safety Committee at its fiftieth session,

1. ADOPTS the Guidelines for the Construction and Equipment of Ships Carrying Hazardous Liquid Wastes in Bulk for the Purpose of Dumping at Sea, which are set out in the Annex to the present resolution;

2. RECOMMENDS that all Governments concerned take appropriate steps to give effect to the Guidelines as soon as possible;

3. REQUESTS the Maritime Safety Committee to keep the Guidelines under review in the light of experience gained and to report as necessary to the Assembly.

ANNEX

GUIDELINES FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING HAZARDOUS LIQUID WASTES IN BULK FOR THE PURPOSE OF DUMPING AT SEA

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Chapter 1 - General

1.1 Application

1.1.1 The Guidelines apply to ships regardless of size the keels of which are laid or which are at a similar stage of construction on or after May 1986.

1.1.2 For the purpose of 1.1.1 "at a similar stage of construction" means the stage at which:

.1 construction identifiable with a specific ship begins; and

.2 assembly of that ship has commenced comprising at least 50 tons or 1% of the estimated mass of all structural material, whichever is less.

1.1.3 The Guidelines also apply to ships used for dumping hazardous liquid wastes for the first time after May 1986 or whose conversion commences after that date, where conversion is necessary prior to such usage.

1.1.4 The Guidelines should be applied to ships not covered by 1.1.1 or 1.1.3, engaged in the dumping of hazardous liquid wastes, as far as reasonable and practicable. The Administration may allow alternative construction, materials or fittings to be used to enable dumping operations to be carried out safely.

1.1.5 Ships regardless of size should comply with the requirements of chapters II-1 and II-2 of the 1974 SOLAS Convention and with chapter II of the 1966 Load Line Convention and any amendments to these chapters of these two conventions which are in force at the time of their building or conversion.

1.1.6 Depending on the nature or amount of the waste, or the length of contract involved, or the length of the intended voyage, the Administration may specify the extent to which a ship should comply with the requirements of the Bulk Chemical Code (resolution A.212(VII)) or the IBC Code (resolution MSC.4(48)).

1.2 Scope

1.2.1 The Guidelines cover hazardous liquid wastes carried in bulk for the purpose of dumping at sea.

1.2.2 The Guidelines cover solid hazardous substances and mixtures carried for the purpose of dumping at sea, provided such substances are handled as liquids, e.g. suspended in liquids or discharged by flushing the tanks with another liquid, except where such solids originate from dredging and sewage sludge.

1.2.3 The Administration should prescribe the conditions of carriage having regard to the risk to the ship, its crew and the environment due to the inherent hazards of the waste carried for the purpose of dumping. Such conditions may be specified for one type of waste or generically.

1.3 Hazards

Hazards of products covered by the Guidelines include:

1.3.1 Fire hazard defined by flashpoint, boiling point, flammability limits and autoignition temperature of the waste.

1.3.2 Health hazard defined by:

.1 irritant or toxic effect on the skin or on the mucous membranes of the eyes, nose, throat and lungs in the gas or vapour state combined with vapour pressure; or

.2 irritational effects on the skin in the liquid state; or

.3 toxic effect, taking into account values of

LD 50 oral: a dose which is lethal to 50% of the test subjects when administered orally;

LD 50 skin: a dose which is lethal to 50% of the test subjects when administered to the skin;

LC 50 : the concentration which is lethal by inhalation to 50% of the test subjects.

1.3.3 Air pollution hazard defined by:

.1 emergency exposure limit (EEL) or LC 50;
.2 vapour pressure;
.3 solubility in water;
.4 relative density of liquid;
.5 vapour density.

1.3.4 Reactivity hazard defined by reactivity with:

.1 other wastes; or
.2 the waste itself (including polymerization).

1.4 Definitions

The following definitions apply unless expressly provided otherwise.

1.4.1 Accommodation spaces are public spaces and those spaces used for corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces. Public spaces are those portions of the accommodation spaces which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

1.4.2 Administration means the Government of the State whose flag the ship is entitled to fly.

1.4.3 Cargo area is that part of the ship that contains cargo tanks, cargo pump-rooms including pump-rooms, cofferdams, ballast or void spaces adjacent to cargo tanks and deck areas over the full beam and length of the ship over the above-mentioned spaces. Where independent tanks are installed in hold spaces, cofferdams, ballast or void spaces at the after end of the aftermost hold space or at the forward end of the forwardmost hold space are excluded from the cargo area.

1.4.4 Cargo pump-room is a space containing pumps and their accessories for the handling of products covered by the Guidelines.

1.4.5 Cargo tank is the envelope designed to contain the cargo.

1.4.6 Cofferdam is the isolating space between two adjacent steel bulkheads or decks. This space may be a void space or a ballast space.

1.4.7 Control stations are those spaces in which ship's radio or main navigating equipment or the emergency source of power is located or where the fire-recording or fire-control equipment is centralized. This does not include special fire-control equipment which can be most practically located in the cargo area.

1.4.8 Flammability limits are the conditions defining the state of fuel-oxidant mixture at which application of an adequately strong external ignition source is only just capable of producing flammability in a given test apparatus.

1.4.9 Flashpoint is the temperature in degrees Celsius at which a product will give off enough flammable vapour to be ignited. Values stated in the Guidelines are "closed cup test" determined by an approved flashpoint apparatus.

1.4.10 Machinery spaces of category A are those spaces and trunks to such spaces which contain:

.1 internal combustion machinery used for main propulsion; or

.2 internal combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or

.3 any oil-fired boiler or oil fuel unit.

1.4.11 Machinery spaces are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal combustion engines, generators and major electrical machinery, oil filling stations, refrigerating, stabilizing, ventilation and air-conditioning machinery, and similar spaces, and trunks to such spaces.

1.4.12 Pump-room is a space, located in the cargo area, containing pumps and their accessories for the handling of ballast and oil fuel.

1.4.13 Service spaces are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces and similar spaces and trunks to such spaces.

1.4.14 1974 SOLAS Convention means the International Convention for the Safety of Life at Sea, 1974, as amended.

1.4.15 Void space is an enclosed space in the cargo area external to a cargo tank other than a hold space, ballast space, oil fuel tank, cargo pump-room, pump-room, or any space in normal use by personnel.

1.4.16 Wastes are those substances for which the competent authority has issued a permit for dumping at sea.

1.5 Equivalents

Where the Guidelines require that a particular fitting, material, appliance, apparatus, item of equipment or type thereof should be fitted or carried in a ship, or that any particular provision should be made, or any

procedure or arrangement should be complied with, the Administration may allow any other fitting, material, appliance, apparatus, item of equipment or type thereof to be fitted or carried, or any other provision, procedure or arrangement to be made in that ship, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance, apparatus, item of equipment or type thereof or that any particular provision, procedure or arrangement is at least as effective as that required by the Guidelines. However, the Administration should not allow operational methods or procedures to be made an alternative to a particular fitting, material, appliance, apparatus, item of equipment, or type thereof, which are prescribed by the Guidelines, unless such substitution is specifically allowed by the Guidelines.

1.6 Emergency dumping

In cases where a hazardous waste is to be dumped at sea in accordance with a special permit issued under the emergency provisions of for example, the London Dumping Convention, the Administration may allow relaxations of the Guidelines taking into account the nature of the emergency and the risk to the crew and the ship.

1.7 Survey and certification

1.7.1 Every ship to which these Guidelines apply should be subject to the surveys specified for tankers in the 1974 SOLAS Convention as amended by the 1978 SOLAS Protocol. Such surveys should be extended to provide for and ensure compliance with the Guidelines.

1.7.2 Following a satisfactory initial survey or inspection of a ship, the Administration or its duly authorized organization should issue an appropriate certificate suitably endorsed to indicate compliance with the provisions of the Guidelines.

1.7.3 The duration and validity of the certificate should be governed by the respective provisions for cargo ships in the 1974 SOLAS Convention as amended by the 1978 SOLAS Protocol.

1.7.4 Where a certificate is issued for a ship referred to in paragraph 1.1.4, it should be endorsed to indicate which provisions of the Guidelines have not been fully complied with.

Chapter 2 - Stability and freeboard

2.1 Stability

2.1.1 During loading, when under way and when engaged in dumping, the ship's stability should be to standards acceptable to the Administration.

2.1.2 Where sequential discharging of cargo tanks and/or ballasting is necessary to meet the stability standards set by the Administration it should be shown to the satisfaction of the Administration that such a sequence is practicable taking into account the necessity of maintaining full directional control, preventing structural damage and ensuring the safety of the crew.

2.2 Loading manual

The master of the ship should be supplied with an approved Loading and Stability Information booklet. This booklet should contain details of typical service conditions, loading, dumping and ballasting operations and provisions for evaluating other conditions of loading. In addition, the booklet should contain sufficient information to enable the master to load and operate the ship in a safe and seaworthy manner. Where sequential discharging and/or ballasting is required during dumping in order to meet the standards set by the Administration, the sequence should be described in the booklet.

Chapter 3 - Ship arrangements

3.1 Cargo segregation

3.1.1 A cargo subject to the provisions of the Guidelines should be segregated from machinery spaces, oil fuel tanks, accommodation and service spaces and from drinking water and stores for human consumption by means of a cofferdam, void spaces, cargo pump-room, pump-room, empty tank, or other similar space, except where otherwise excluded by the Guidelines.

3.1.2 Cargoes which react in a hazardous manner with other cargoes should:

.1 be segregated from such other cargoes by means of a cofferdam, void space, cargo pump-room, pump-room, empty tank, or a mutually compatible cargo;

.2 have separate pumping and piping systems which should not pass through other cargo tanks containing such cargoes, unless encased in a tunnel; and

.3 have separate tank vent systems.

3.1.3 Cargo piping should not pass through any accommodation or machinery space other than cargo pump-rooms or pump-rooms.

3.1.4 A cargo subject to the provisions of the Guidelines should not be carried in either the fore or aft peak tanks.

3.2 Accommodation, service and machinery spaces and control stations

3.2.1 No accommodation or service spaces or control stations should be located within the cargo area.

3.2.2 In order to guard against the danger of hazardous vapours, due consideration should be given to the location of air intakes and openings into

accommodation, service and machinery spaces and control stations in relation to cargo piping and cargo vent systems. The distance between openings into the accommodation or machinery spaces and outlets from cargo vent systems and cargo pump-rooms should be to the satisfaction of the Administration.

3.3 Cargo pump-rooms

3.3.1 Cargo pump-rooms should not contain machinery, other than cargo pumps and bilge/ballast pumps serving spaces within the cargo area, when the flashpoint of the waste is 60°C or less or whenever the waste may generate flammable gases when in contact with metals.

3.3.2 Cargo pump-rooms should be so arranged as to ensure:

.1 unrestricted passage at all times from any ladder-platform and from the floor; and

.2 unrestricted access to all valves necessary for cargo handling for a person wearing the required personnel protective equipment.

3.3.3 Permanent arrangements should be made for hoisting an unconscious person with a rescue line while avoiding any projecting obstacles.

3.3.4 Guard railings should be installed on all ladders and platforms.

3.3.5 Normal access ladders should not be fitted vertically and should incorporate platforms at suitable intervals.

3.3.6 Means should be provided to deal with drainage and any possible leakage from cargo pumps and valves in cargo pump-rooms. The bilge system serving the cargo pump-room should be operable from outside the cargo pump-room. Provision should be made for transferring contaminated water to cargo tanks or ashore.

3.3.7 Pump discharge pressure gauges should be provided outside the cargo pump-room.

3.3.8 Where machinery is driven by shafting passing through a bulkhead or deck, gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal should be fitted in way of the bulkhead or deck.

3.4 Access to spaces in the cargo area

3.4.1 Arrangements for void spaces, cargo tanks and other spaces in the cargo tank area should be such as to ensure adequate access for complete inspection.

3.4.2 Access to the cargo tanks should be direct from the open deck.

3.4.3 For access through horizontal openings, hatches or manholes, the dimensions should be sufficient to allow a person wearing a breathing apparatus to ascend or descend any ladder without obstruction and also to provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening should be not less than 600 mm x 600 mm.

3.4.4 For access through vertical openings or manholes providing passage through the length and breadth of the space, the minimum clear opening should be not less than 600 mm x 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other footholds are provided.

3.4.5 Smaller dimensions may be approved by the Administration in special circumstances.

3.5 Bilge and ballast arrangements

3.5.1 Pumps, ballast lines, vent lines and other similar equipment serving permanent ballast tanks should be independent of similar equipment serving cargo tanks and of cargo tanks themselves. Discharge arrangements for permanent ballast tanks sited immediately adjacent to cargo tanks should be outside machinery spaces and accommodation spaces. Filling arrangements may be in the machinery spaces provided that such arrangements ensure filling from tank deck level and nonreturn valves are fitted.

3.5.2 Filling of ballast in cargo tanks may be arranged from deck level by pumps serving permanent ballast tanks, provided that the filling line has no permanent connection to cargo tanks or piping and that nonreturn valves are fitted.

3.5.3 Bilge pumping arrangements for cargo pump-rooms, pump-rooms, void spaces, cargo slop tanks, double bottom tanks and similar spaces should be situated entirely within the cargo area except for double bottom tanks and ballast tanks where such spaces are separated from tanks containing cargo or residues of cargo by a double bulkhead.

3.6 Pump and pipeline identification

Provisions should be made for the distinctive marking of pumps, valves and pipelines to identify the service and tanks which they serve.

3.7 Stern dumping arrangements

3.7.1 Subject to the approval of the Administration, cargo piping may be fitted to permit stern dumping. Portable arrangements should not be permitted.

3.7.2 Stern dumping lines should not be used for the loading of waste substances.

3.7.3 In addition to 5.1, the following provisions apply:

.1 The piping outside the cargo area should be fitted inboard on the open deck. Such piping should be clearly identified and fitted with a shutoff valve at its connection to the cargo piping system within the cargo area. At this location, it should also be capable of being separated by means of a removable spool-piece and blank flanges when not in use when waste is carried with a flashpoint less than 60°C.

.2 The piping should be full penetration butt welded, and flange connections in the piping should only be permitted within the cargo area and at the connection to the outboard end of the dumpline except in exceptional cases specifically approved by the Administration.

.3 Spray shields should be provided at the connections specified in .2 as well as collecting trays of sufficient capacity with means for the disposal of drainage.

.4 The piping should be self-draining to the cargo area or overboard and preferably into a cargo tank.

.5 Arrangements should be made to allow such piping to be washed after use and maintained gas-safe when not in use. The relevant connections to the piping should be provided with a shutoff valve and blank flange.

3.7.4 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations should not face aft. Port lights facing aft should be of the fixed (non-opening) type. In addition, during the use of stern dumping arrangements, all doors, ports and other openings on the superstructure or deckhouse side where the dumpline is located should be kept closed.

Chapter 4 - Cargo containment

4.1 Cargo tanks

Cargo tanks should be constructed taking into account the pressures due to the cargo density and to sloshing during dumping operations. The cargo density should be assumed to be at least 1400 kg/m^3. The ship's shell plating may form the tank boundary.

Chapter 5 - Cargo transfer

5.1 Piping arrangements

5.1.1 The design and construction of cargo piping systems should comply with the standards of the Administration, taking into account the provisions of this chapter. The materials should be sufficiently resistant to the waste.

5.1.2 All piping system components should have a pressure rating not less than the maximum pressure to which the system may be subjected. Piping which is not protected against overpressure by a pressure relief valve, or which can be isolated from its relief valve should be designed to withstand the greatest pressure the piping would experience in service, taking into consideration:

.1 cargo vapour pressure at 45°C;

.2 pressure rating of the cargo tank;

.3 maximum discharge pressure of the associated pump and its relief valve setting; and

.4 maximum hydrostatic pressure, that could be generated in the piping, during normal operations.

5.1.3 .1 Except for the use of hoses for connecting the ship's piping to the shore piping, cargo should be handled only by means of fixed piping systems.

.2 Cargo piping should be located within the cargo area, except as permitted by 3.7.

5.1.4 Runs of cargo piping through bulkheads should be so arranged as to preclude excessive stresses at the bulkhead and should not utilize flanges bolted through the bulkhead.

5.2 Cargo transfer control systems

5.2.1 For the purpose of adequately controlling the cargo, cargo transfer systems should be provided with:

.1 one stop valve capable of being manually operated on each tank filling and discharge line, located near the tank penetration; if individual deepwell pumps are used to discharge the contents of each cargo tank a stop valve at the tank is not required on the discharge line;

.2 one stop valve at each cargo hose connection;

.3 remote shutdown devices for all cargo pumps and similar equipment.

5.2.2 The controls necessary during transfer and/or transport of cargoes covered by the Guidelines other than in cargo pump-rooms which have been dealt with elsewhere in the Guidelines should not be located below the weather deck.

5.3 Ship's cargo hoses

5.3.1 Hoses used for cargo transfer should be compatible with the cargo and suitable for the cargo temperature.

5.3.2 Hoses subject to tank pressure or the discharge pressure of pumps should be designed for a bursting pressure not less than 5 times the maximum pressure the hose will be subjected to during cargo transfer.

5.3.3 Each cargo hose should have been hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure and not more than two-fifths of its bursting pressure. The hose should be stencilled or otherwise marked with its specified maximum working pressure and, if used in other than ambient temperatures, with its maximum and/or minimum service temperature. The specified maximum working pressure should not be less than 10 bar gauge.

5.4 Spray shields and drip trays

Flanges of the cargo piping system as well as flanges of the loading and discharge manifold connections should be provided with shields which may be portable to guard against the danger of the cargo being sprayed; in addition, drip trays should also be provided to guard against leakage onto the deck below the manifold.

Chapter 6 - Materials of construction

6.1 General

6.1.1 Materials used for tank construction, together with associated piping, pumps, valves, vents and their jointing materials should be suitable at the carriage temperature and pressure for the cargo to be carried to the satisfaction of the Administration. Coated, lined or unprotected steel is assumed to be the normal material of construction, depending on the nature of the cargo.

6.1.2 Where applicable the following should be taken into account in selecting the material of construction:

.1 corrosive effect of the cargo taking into account neutralizing additives;

.2 possibility of hazardous reactions between the cargo and the material of construction; and

.3 suitability of linings and coatings.

Chapter 7 - Cargo temperature control

Hazardous liquid wastes do not normally require temperature control. Where this is found necessary the provisions of chapter 7 of the International Bulk Chemical Code should be used as guidance and the relevant provisions of chapter 10 of that Code taken into account in so far as they concern heated flammable cargoes.

Chapter 8 - Tank vent systems

8.1 General

8.1.1 All cargo tanks should be provided with a venting system appropriate to the cargo being carried.

8.1.2 Where an open venting system is provided for liquid wastes with a flashpoint exceeding 60°C, the vent outlets should be arranged to prevent the entrance of water into the cargo tanks. In no case should shutoff valves or isolating arrangements be placed between the cargo tank and the vent outlet.

8.1.3 A controlled venting system should be provided for flammable liquid wastes with a flashpoint not exceeding 60°C; the arrangements should be in accordance with regulation 59 of chapter II-2 of the 1974 SOLAS Convention as amended.

Chapter 9 - Electrical installations

9.1 General

9.1.1 The provisions of this chapter are applicable to ships carrying liquid wastes and solid wastes handled as liquids, which are inherently, or due to their reaction with other substances, flammable and corrosive to electrical equipment and which may develop flammable gases when in contact with metals. These provisions should be applied in conjunction with the applicable requirements of part D, chapter II-1 of the amended 1974 SOLAS Convention.

9.1.2 Electrical apparatus or part thereof which may be in direct contact with the liquid wastes carried should be suitably resistant to reaction with the wastes.

9.1.3 Electrical equipment and wiring should not be installed in the hazardous locations referred to in 9.2 unless essential for operational purposes when the exceptions listed in 9.2.2 may be permitted.

9.1.4 Where electrical equipment is installed in the hazardous locations as permitted in this chapter it should be to the satisfaction of the Administration and certified by the relevant authorities, recognized by the Administration, for operation in flammable atmospheres. Such certification and operation should take into account that wastes may be corrosive to metals and that the flammable atmosphere may be a hydrogen/air mixture.

9.1.5 The Administration should take appropriate steps to ensure uniformity in the implementation and application of the provisions of this chapter in respect of electrical installations.*

9.1.6 Where liquid wastes are to be carried which have a flashpoint of 60°C or less, the International Bulk Chemical Code paragraphs 10.1, 10.2.3 and 10.3 should be applied. However, where the flashpoint of the waste is due to a flammable component dissolved in water and the waste does not sustain burning the Administration may allow relaxations from such provisions.

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* Reference is made to the recommendations published by the International Electrotechnical Commission and in particular to publication 92-502.

9.2 Hazardous locations and types of equipment and wiring

9.2.1 The restrictions in this section do not preclude the use of intrinsically safe systems and circuits in all hazardous locations including cargo piping. It is particularly recommended that intrinsically safe systems and circuits are used for measurement, monitoring, control and communication purposes.

9.2.2 All enclosed spaces within the cargo area are to be considered as hazardous spaces. In addition to intrinsically safe systems and circuits the only hazardous locations where electrical installations are permitted are:

.1 Cargo tanks and cargo piping:
No additional electrical equipment is permitted.

.2 Void spaces adjacent to, above or below integral tanks:

.2.1 Through runs of cables. Such cables should be installed in heavy gauge steel pipes with gastight joints. Expansion bends should not be fitted in such spaces.

.2.2 Electrical depth sounding or log devices and impressed current cathodic protection system anodes or electrodes. These devices should be housed in gastight enclosures; associated cables should be protected as referred to in 9.2.2.2.1.

.3 Hold spaces containing independent cargo tanks:

.3.1 Through runs of cables without any additional protection.

.3.2 Lighting fittings with pressurized enclosure or of the flameproof type. The lighting system should be divided between at least two branch circuits. All switches and protective devices should interrupt all poles or phases and should be located in a non-hazardous location.

.3.3 Electrical depth sounding or log devices and impressed current cathodic protection system anodes or electrodes. These devices should be housed in gastight enclosures.

.4 Cargo pump-rooms:

.4.1 Lighting fittings with pressurized enclosures or of the flameproof type. The lighting system should be divided between at least two branch circuits. All switches and all protective devices should interrupt all poles or phases and should be located in a non-hazardous location.

.4.2 Electrical motors for driving cargo pumps and any associated auxiliary pumps should be separated from these spaces by a gastight bulkhead or deck. Flexible couplings or other means of maintaining alignment should be fitted to the shafts between the driven equipment and its motors and, in addition, glands should be provided to the satisfaction of the Administration where the shafts pass through the bulkhead or deck. Such electrical motors should be located in a compartment having positive pressure ventilation.

.4.3 Flameproof general alarm audible indicator.

.5 Zones on open deck within 3 m of any cargo tank outlet and ventilation opening to cargo pump-rooms:

.5.1 Equipment of a certified safe type, adequate for open deck use.

.5.2 Through runs of cables.

.6 Enclosed or semi-enclosed spaces in which pipes containing cargoes are located; enclosed or semi-enclosed spaces immediately above cargo tanks (e.g. between decks) or having bulkheads above and in line with cargo tank bulkheads; enclosed or semi-enclosed spaces immediately above cargo pump-rooms or above vertical cofferdams adjoining cargo tanks unless separated by a gastight deck and suitably ventilated; and compartments for cargo hoses:

.6.1 Lighting fittings of a certified safe type. The lighting system should be divided between at least two branch circuits. All switches and protective devices should interrupt all poles or phases and should be located in a non-hazardous location.

.6.2 Through runs of cables.

.7 Enclosed or semi-enclosed spaces having a direct opening into any hazardous location referred to above should have electrical installations complying with the requirements for the space or zone into which the opening leads.

9.3 Bonding

Independent cargo tanks should be electrically bonded to the hull. All gasketed cargo pipe joints and hose connections should be electrically bonded.

Chapter 10 - Instrumentation

10.1 Gauging

10.1.1 Open gauging may be allowed with all cargoes. Openings for gauging should be provided with permanently attached gastight covers capable of being properly secured.

10.1.2 When flammable liquids are carried, openings for gauging should be provided with self-closing covers.

10.2 Vapour detection

10.2.1 Ships carrying flammable or toxic waste should be equipped with at least two portable instruments designed and calibrated for testing for the specific vapours in question. If such instruments are not capable of testing for both toxic concentrations and flammable concentrations then two separate sets of instruments should be provided.

Chapter 11 - Personnel protection

11.1 Protective equipment

11.1.1 For the protection of crew members who are engaged in loading and discharging operations, the ship should have on board at least four sets of suitable protective equipment consisting of large aprons, special gloves with long sleeves, suitable footwear, coveralls of chemical-resistant material, and tight-fitting goggles or face shields. The protective clothing and equipment should cover all skin so that no part of the body is unprotected.

11.1.2 Work clothes and protective equipment should be kept in easily accessible places and in special lockers. Such equipment should not be kept within accommodation spaces with the exception of new, unused equipment and equipment which has not been used since undergoing a thorough cleaning process. The Administration may, however, approve storage rooms for such equipment within accommodation spaces if adequately segregated from living spaces such as cabins, passageways, dining rooms, bathrooms, etc.

11.1.3 Protective equipment should be used in any operation which may entail danger to personnel.

11.2 Safety equipment

11.2.1 Medical first-aid equipment should be kept on board including oxygen resuscitation equipment and antidotes for wastes carried.

11.2.2 Suitably marked decontamination showers and an eyewash should be available on deck in convenient locations. The showers and eyewash should be operable in all ambient conditions. Where supplementary seawater decontamination arrangements are provided, due consideration should be given to the relative positions of sea suctions and cargo pump overboard discharges.

11.2.3 A stretcher which is suitable for hoisting an injured person up from spaces such as the cargo pump-room should be placed in a readily accessible location.

Chapter 12 - Operational requirements

12.1 Tank filling

12.1.1 Tanks carrying liquids at ambient temperatures should be so loaded as to avoid the tank becoming liquid-full during the voyage, having due regard to the highest temperature which the cargo may reach.

12.2 Cargo information

12.2.1 A copy of these Guidelines or national regulations incorporating their provisions should be on board every ship covered by these Guidelines.

12.2.2 Information should be on board and available to all concerned, giving the necessary data for the safe carriage of the cargo. Such information should include a cargo stowage plan to be kept in an accessible place, indicating all cargo on board including each type of waste:

.1 an adequate description of the physical and chemical properties necessary for the safe containment of the cargo;

.2 action to be taken in the event of spills or leaks;

.3 counter-measures against accidental personal contact;

.4 fire-fighting procedures and fire-fighting media; and

.5 procedures for cargo transfer, tank cleaning, gas-freeing and ballasting.

12.2.3 If sufficient information necessary for the safe transportation of the waste is not available, the waste should be refused.

12.3 Personnel training

12.3.1 All personnel should be adequately trained in the use of protective equipment and have basic training in the procedures appropriate to their duties, necessary under emergency conditions.

12.3.2 Personnel involved in cargo operations should be adequately trained in handling procedures.

12.3.3 Officers should be trained in emergency procedures to deal with conditions of leakage, spillage or fire involving the cargo and a sufficient number of them should be instructed and trained in essential first aid for cargoes carried.

12.4 Opening of and entry into cargo tanks

12.4.1 During handling and carriage of cargoes producing flammable vapours, or when ballasting after the discharge of such cargo, or when loading cargo, cargo tank lids should always be kept closed and ullage and tank washing access covers should be open only when necessary.

12.4.2 Personnel should not enter cargo tanks, void spaces around such tanks, cargo handling spaces or other enclosed spaces unless:

.1 the compartment is free of toxic vapours and not deficient in oxygen; or

.2 personnel wear breathing apparatus and other necessary protective equipment and the entire operation is under the close supervision of a responsible officer.

12.4.3 Personnel should not enter such spaces when the only hazard is of a purely flammable nature, except under the close supervision of a responsible officer.
