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HONG KONG MERCHANT SHIPPING NOTICE

**Merchant Shipping (Safety) (Dangerous Goods and Marine Pollutants) Regulation**

*To : Shipowners, Masters and Agents*

**Summary**

The purpose of this Notice is to give practical guidance on the obligations imposed by regulation 3 and on the operations involved. Attached to this Notice at Annex 1 is a Code of Practice which takes into account recommendations issued by the International Maritime Organization (IMO) on the safe transport, handling and storage of dangerous substances in port areas.

1. Regulation 3 of the above Regulation requires the owners and masters of, as well as employers of persons aboard, ships in which dangerous substances are being carried, stowed, handled, loaded or unloaded to ensure that, so far as is reasonably practicable, nothing in the manner in which those substances are being carried, stowed, handled, loaded or unloaded is such as might create a risk to the health and safety of any person.
2. The Code of Practice, which is referred to in regulation 3(4), gives guidance on many aspects of the handling, loading and unloading of dangerous goods. Additional recommendations relating to the safe handling of dangerous substances in harbours are contained in the internationally recognized codes and guides listed at Annex 2.
3. In addition, there may be other national regulations and local requirements which must be complied with in ports in other countries, and of which owners and masters of ships should make themselves aware. It is recognized that it may be unavoidable on occasions that Hong Kong ships in ports abroad have to load dangerous good in accordance with the requirements of that particular country. In such cases the master should ensure that safe practices are followed.

Marine Department  
Multi-lateral Policy Division

4 November 1999

## **CODE OF PRACTICE FOR THE HANDLING, LOADING AND UNLOADING OF DANGEROUS GOODS IN HARBOUR AREAS**

The term "dangerous substances" when used in this Code has the same meaning as the term "dangerous goods" in the Merchant Shipping (Safety) (Dangerous Goods and Marine Pollutants) Regulation.

### **GENERAL DUTIES**

#### **Supervision of operations**

1. The master should ensure that the loading or unloading of dangerous substances is carried out under the overall supervision of a duly qualified officer of the vessel, and that the officer is aware of the risks involved, the correct procedures to be followed, and the steps to be taken in an emergency.

#### **Intoxicated persons**

2. The master should as far as reasonably practicable ensure that no one whose actions are not under proper control, e.g. as a result of drink or drugs, is allowed to be in charge of operations involving the handling of any dangerous substance or to handle dangerous substances or to remain in an area where dangerous substances are being handled, if his presence could put at risk the health and safety of himself or others.

#### **Operational and emergency information**

3. The master or owner of a vessel carrying, loading or unloading dangerous substances within a harbour should ensure that information on the dangerous substances in the vessel and stability of the vessel is in the possession of the duly qualified officer appointed in pursuance of paragraph 1, and is available for the use of the emergency services.

4. The information provided in accordance with paragraph 3 above should include:

- (a) (i) in the case of packaged dangerous substances, the correct technical name, the UN number (where it exists) and the classification; or
- (ii) in the case of dangerous liquids (including liquefied gases) in bulk, the correct technical name, the UN number (where available) and a description of the relevant physical and chemical properties (including reactivity);
- (b) the quantity of the respective dangerous substances and place of stowage;
- (c) action to be taken in the event of spills or leaks;
- (d) counter-measures against accidental personal contact;
- (e) fire-fighting procedures and fire-fighting media;
- (f) procedures for loading and discharging of cargo, gas-freeing, ballasting and tank-cleaning;
- (g) special equipment needed for the safe loading or discharge of the particular cargo.

#### **Overfilling of tanks**

5. During the operation of loading or unloading a dangerous substance into or from any tank on the vessel, the master should ensure that all necessary precautions are taken to prevent such tanks being overfilled, taking into account the necessity for ullage.

### **Weather precautions**

6. The master should not allow dangerous substances to be loaded or unloaded in weather conditions which are likely to give rise to any exceptional hazard, and should comply with any direction of the harbour master or berth operator to cease such operations.

### **General precautions for handling packaged dangerous substances**

7. Anyone carrying or handling packaged dangerous substances should take care to ensure, as far as possible, that no damage is done to any receptacle containing dangerous substances, that no dangerous substances are allowed to escape from a receptacle and that such substances do not affect the health or safety of anyone.

8. Receptacles containing dangerous substances should be handled to the minimum extent necessary and stacked in such a way that they will not be subjected to excessive weight or the risk of damage from other causes.

9. While dangerous substances are being handled, the master should ensure that precautions are taken to prevent unauthorized access to such dangerous substances, and make every reasonable endeavour to prevent any person from committing any act which would lead to a fire or other dangerous situation.

10. The duly qualified officer in charge of the loading or unloading of a vessel should ensure that precautions are taken to avoid as far as reasonably practicable any risk of damage to packaged dangerous substances stowed in the vessel, on deck or on the berth by falling cargo or otherwise.

11. No one should, without reasonable cause, remove or wilfully deface any label, sign or mark attached to, or displayed on, a receptacle, freight container, portable tank, or other cargo unit.

12. The master should ensure that precautions are taken to secure dangerous substances against theft or wrongful removal.

### **Transfer of dangerous liquids in bulk**

13. The master should ensure that equipment used in the transfer of dangerous liquids in bulk is of an adequate standard and is used properly, taking into account sections (a) to (1) below.

*Note: In the following paragraphs the term "pipeline" includes all connecting pipes, hoses, and other ancillary equipment used for the handling, loading or unloading of dangerous substances.*

#### *(a) Condition of pipelines*

14. The pipeline should be properly designed, of adequate strength and of good construction from sound and suitable material, and should be properly maintained. Any pipeline liable to damage by impact should be suitable protected. A pipeline should not be used for any substances other than those for which it is suitable, having regard to the temperature and compatibility of the product.

15. The pressure to which a pipeline is subjected should not exceed the specified maximum working pressure; in the case of liquefied flammable or toxic gases, this should be achieved by incorporating one or more safety relief devices, which should discharge to a safe place.

#### *(b) Pipelines used for flammable liquids or gases*

16. In order to provide protection against arcing during connection and disconnection, the master should ensure that cargo hose strings and metal arms are fitted with an insulating flange or a single length of non-conducting hose to ensure electrical discontinuity between the ship and shore. All pipe-work on the seaward side of the insulating section should be electrically continuous to the ship, and that on the landward side should be electrically continuous to the jetty earthing system.

17. The insulating flange or single length of non-conducting hose should not be short-circuited by contact with external metal; for example, an exposed metallic flange on the seaward side of the insulating flange or hose length should not make contact with the jetty structure either directly or through hose handling equipment.

18. Insulating flanges should be inspected and tested periodically to ensure that the insulation is clean and in good condition. The resistance should be measured between the metal pipe on the shore side of the flange and the end of the hose or metal arm when freely suspended. The measured value should be not less than 1,000 ohms. A low resistance may indicate damage to, or deterioration of, the insulation.

19. Cargo hoses with internal bonding between the end flanges should be checked for electrical continuity before they are taken into service and periodically thereafter.

*Note: Attention is drawn to the fact that the use of a ship/shore bonding cable is not only considered to be ineffective but could also be a hazard to safety.*

(c) *Hoses*

20. Whenever appropriate, the master should be in possession of a certificate given by the supplier of any hose forming part of the pipeline, to the effect that a burst test has been carried out on a sample of exactly the same type of hose at an appropriate test pressure selected so as to ensure that such a hose is unlikely to burst in service. In vessels carrying dangerous chemicals or liquefied gases the burst pressure of the hose should in no case be less than five times its service pressure.

21. Before a hose is used for the first time for loading or unloading bulk dangerous liquids, and subsequently at intervals not greater than one year, it should be subjected to a thorough inspection including internal examination and a test at proof pressure. An hydraulic method of testing the hose is to be preferred, but this is not suitable in all cases; where any residual hydraulic medium could cause problems (for example, where water might cause corrosion), pneumatic test methods should be used.

22. The annual examination and proof pressure test of a hose should also include measurement of the electrical resistance of the assembly. Where the hose is intended to be electrically continuous, the resistance of the complete assembly should not be more than 15 ohms. If the hose is intended to be non-conducting, for use in place of an insulating flange, the resistance should not be less than 25,000 ohms.

23. Each hose should be indelibly marked to indicate the substances for which it is suitable, its specified working pressure, the proof test pressure and the last date on which it was tested at this pressure, and, if used at service temperatures other than ambient, the maximum or minimum service temperature.

24. Before a hose is put into use on any day, it should be visually inspected by a competent person for signs of deterioration, and found to be satisfactory.

25. While the hose is rigged for use, it should be kept under supervision.

26. After having been used for the loading or unloading of highly toxic liquids or of liquefied gases, the hose should be drained before disconnection. Fittings for the closure of hoses should be provided at each end, and all such hoses should be closed and kept closed until they are re-connected, unless they have been made safe by the process of draining and purging.

27. Mooring lines should be tended as necessary, so as to avoid placing excessive stress on a hose.

(d) *Testing of controls and systems*

28. Before the transfer of a dangerous substance by pipeline into or from a vessel begins, the master of the vessel should ensure that cargo-handling controls and, where fitted, emergency shutdown and alarm systems, which are required to be operative for the safe loading or discharging of cargo, are in good working order.

(e) *Loading and unloading rates*

29. Before dangerous substances in bulk are transferred by pipeline to or from any vessel, the master and the berth operator should agree the maximum loading or unloading rate which can be undertaken safely, taking into account:

- (i) the arrangement and capacity of the vessel's cargo pipelines and the vapour-venting and inert gas systems of the vessel;
- (ii) the maximum working pressure in the hoses and associated pipe-work in the vessel and on shore;
- (iii) a possible pressure increase due to an emergency shut-down; and
- (iv) possible accumulation of electrostatic charge in liquids with conductivities of less than 100pS/m, which require a low initial flow rate.

30. During loading or unloading, frequent checks should be made to ensure that the agreed loading or unloading rates are not exceeded.

(f) *Communications*

31. During the loading or unloading of dangerous liquids by means of a pipeline, the master of the vessel should ensure that effective communication is maintained between people on the vessel, on the berth and at the storage installation, in order that the transfer operation may be safely controlled.

(g) *Start of discharge*

32. The master of a vessel carrying dangerous substances in bulk which are to be unloaded at a berth should commence the discharge of such substances as soon as reasonably practicable after arrival at the berth, unless other arrangements have been agreed with the harbour master and berth operator.

(h) *Flammable or toxic vapours*

33. The master should ensure that all reasonably practicable steps are taken to control any escape of flammable or toxic vapour which may give rise to danger. He should ensure in particular that precautions are taken to prevent flammable or toxic vapour from entering galley or accommodation and machinery spaces during the loading or unloading of flammable or toxic liquids, or during the loading of any bulk cargo or ballast water into tanks which have previously contained flammable or toxic liquids and which have not been freed of flammable or toxic vapour, or when tanks are being freed of flammable or toxic vapour or are being cleaned after the unloading of flammable or toxic liquids.

34. Unless the ship's design dictates otherwise, cargo should be loaded with the ullage, sounding and sighting ports securely closed. The gas displaced by the incoming cargo should be vented to atmosphere via the vent stacks or through high or constant velocity valves, to ensure that the gases are taken clear of the cargo deck, unless alternative arrangements are provided for the return of cargo vapours to shore facilities.

(i) *Prevention of spillages*

35. The master should ensure that, should an incident occur during the handling of dangerous substances or ballast water contaminated with dangerous substances which necessitates a repair to the plant, pipe or connections or which interferes in any way with the uninterrupted flow of dangerous substances or ballast water, such operations are stopped if it is safe to do so and are not resumed until adequate safety measures have been taken.

36. The master of a vessel carrying dangerous liquids in bulk should ensure that all reasonably practicable steps are taken to prevent any spillages of dangerous substances on the vessel, onto the berth or into harbour waters.

37. The master should ensure in particular that:

- (i) while at berth, all scuppers of the cargo deck are kept closed, except so far as is necessary to allow water only to be drained off, or for the protection of the vessel and the crew, and are inspected periodically during loading and unloading, to ensure that they are kept closed. Where refrigerated gases or corrosive liquids are being handled, the scuppers may be left open, provided that an ample supply of water is available at all times in the vicinity of the manifolds;

- (ii) a cargo hose is adequately supported in use, so that no excessive strain is placed on the hose or the couplings;
- (iii) at the start of, and at regular intervals throughout, loading, unloading, ballasting and tank washing, watch is kept to ensure that dangerous liquids are not escaping through sea valves, and that, when not in use, sea and overboard discharge valves connected to the cargo or ballast system are closed and lashed. When lashing is not practicable, as with hydraulic valves, some suitable means of marking should be used, to indicate clearly that the valves are to remain closed;
- (iv) flange couplings are jointed, so as to be liquid-tight or gas-tight, as appropriate, and that flange faces, gaskets and seals are clean and in good condition. Where bolted connections are made, appropriate bolts in good condition should be used. All bolt holes should be used, and care taken in tightening the bolts, as uneven or overtightened bolts could result in leakage or fracture;

*Note: This does not preclude the use of an effective quick-release device.*

- (v) a drip tray is provided under the manifold connection, of sufficient capacity, maintained in good condition and in place throughout loading or unloading; and
- (vi) no sea suction valve connected to a cargo tank is open for ballast purposes before full suction has been obtained on the ballast pump.

(j) *Loading and unloading of liquefied gases*

38. The master should ensure that, during the loading or unloading of liquefied gas by pipeline, measures are taken to ensure that no gas is allowed to escape into the atmosphere, except:

- (i) in the case of the operation of a safety device for the release of an accidental increase in pressure; or
- (ii) during the venting of inert gases from a ship's tank; or
- (iii) with the permission of the harbour master.

39. The master should ensure that the loading or unloading of liquefied gas at low temperature is carried out in such a way that:

- (i) where appropriate, all tanks and pipelines are gradually and evenly cooled, to prevent thermal stress; and
- (ii) adequate arrangements are made for the safe removal of any vapours and condensate which may form in a pipeline when the pipeline is being cooled.

(k) *Vessels' stores*

40. The master should ensure that vessels' stores are not loaded or unloaded in a manner that may be liable to cause damage to the connecting pipelines or associated equipment, or may otherwise endanger the operation in progress during:

- (i) the loading or unloading of liquid dangerous substances in bulk;
- (ii) the loading or unloading of ballast water contaminated with dangerous substances;
- (iii) gas-freeing; or
- (iv) tank-cleaning.

(l) *Completion of operations*

41. The master should ensure that, after the completion of every transfer of liquid dangerous substances in bulk, all precautions are taken to render pipelines, valves and associated ancillary equipment safe. The valves of the discharging and receiving tanks should be closed, unless they are required to be open for normal vessel operations. After the disconnection of the vessel from the shore pipelines, the vessel's manifold connection should be blanked off.

42. After a vessel has completed the loading or unloading of dangerous substances in bulk and any necessary voyage requirements, including bunkering, ballasting and storing, the master should ensure that the vessel sails as soon as practicable, unless otherwise directed or permitted by the harbour master.

### **Discharge of harmful vapours or dusts to the atmosphere**

43. During the loading or unloading of liquids or solids in bulk which might give rise to harmful vapours or dusts, the master should endeavour to prevent the escape of such vapours or dust in a dangerous manner or in dangerous quantities. Solids which may interact with water to give off flammable or toxic gases, and which are loaded, unloaded or stored in bulk, should be protected to avoid contact with water. Suitable precautions should be taken to ensure that no one is exposed to the risk of inhaling a dangerous concentration of any toxic gas which may be evolved by such a substance, or of inhaling other harmful vapours or dusts.

### **Combination carriers**

*Note: The term "combination carrier" used in the following paragraph means a vessel designed to carry either flammable liquids with a flashpoint not exceeding 60°C or alternatively solid cargoes in bulk.*

44. The master of a combination carrier which has carried flammable liquids in bulk should not in general load any solid substances in bulk into a hold, unless the hold and all other holds, cargo tanks, duct keels, cargo pumprooms, pumps and pipelines, cofferdams and void spaces are free from flammable liquid, vapour and gas. The following Merchant Shipping Regulations should also be referred to, as appropriate:

- (1) the Merchant Shipping (Safety) (Fire Protection) (Ships Built Before 25 May 1980) Regulations, as amended;
- (2) the Merchant Shipping (Safety) (Fire Appliances) (Ships Built On or After 25 May 1980 but Before 1 September 1984) Regulations, as amended; or
- (3) the Merchant Shipping (Safety) (Fire Protection) (Ships Built On or After 1 September 1984) Regulations, as amended.

### **Special precautions for the handling of explosives**

#### *(a) Handling of packages*

45. Packages containing explosives should not be unloaded from a vessel at a berth unless the vehicle by which they are to be removed is in readiness to receive them. When loading or unloading of explosives has begun, such loading should proceed with due diligence. The master should ensure that, if other dangerous goods are loaded into or from any vessel at any time during the loading or unloading of explosives or at any time when the hatches of explosives stowage compartments are open, all practicable steps are taken to ensure that the explosives are not put at risk.

46. The hold of any vessel into which explosives are to be placed should be carefully cleaned and maintained in a clean condition.

47. The master of a vessel should not permit the loading or unloading of packages containing explosives in inclement weather, unless such packages are adequately protected either by their own intrinsic nature or by some external means.

48. Because of the risk of powder or other granular material sifting from packages containing explosive substances, boots or shoes with metal nails, metal heels or metal tips of any kind should not be worn at or near a place where such packages are being loaded or unloaded, unless the boots or shoes are suitably protected so as to avoid the possibility of an incendive spark. This provision does not apply to explosive articles such as ammunition.

#### *(b) Bunkering*

49. The master should ensure that fuel oil is not loaded into a vessel's bunkers during the loading or unloading of explosives into or from the vessel, nor at any time when the hatches of the compartments in which such goods are stowed are off, unless with the permission of the harbour master. This provision does not apply to Division 1.4 explosives.

(c) *Radio or radar transmitters*

50. The master should ensure that, during the handling of any articles of Class 1, except for those in Division 1.4, no radio or radar transmitter is used within 50 metres of the articles, except for:

- (i) one communication transmitter, provided that the power output does not exceed 1.5kW and no part of the aerial system is within 5 metres of the articles;
- (ii) VHF radiotelephone transmitters or portable transmitters, provided that the power output does not exceed 25 watts and no part of the aerial system is within two metres of the articles.

(d) *Electrical equipment*

51. During the loading or unloading of any explosives into or from a vessel, the master should ensure that all electrical equipment used near such goods is suitable. No artificial lighting other than electrical lighting (including portable electrical lighting) should be used.

### **Weight distribution of bulk dangerous substances**

52. The master of a vessel should ensure that excessive bending moments or shear forces are not introduced into the structure of the vessel by uneven weight distribution.

## **PRECAUTIONS AGAINST FIRE AND EXPLOSIONS**

### **Sources of ignition**

(a) *Supervision of boiler fires, funnel uptakes and boiler tubes*

53. While a vessel carrying dangerous substances is at a berth, the master should ensure that:

- (i) boiler fires are kept under supervision (this does not preclude the use of automatic alarms, provided that the supervisor is within hearing of the alarm);
- (ii) funnel uptakes and boiler tubes are not blown without the permission of the harbour master.

(b) *Use of tools and equipment*

54. The master of a vessel should ensure that, where there is a possibility of accidental ignition of flammable vapours in the vicinity:

- (i) care is exercised to avoid causing a spark when using tools, including those used for sampling or ullaging;

*Note: So-called non-sparking tools made from metals other than steel are only marginally less likely to give rise to an incendive spark than tools made of steel. Particles of grit are likely to become embedded in the surface of non-ferrous tools and may cause incendive sparks on impact with ferrous or other hard metals.*

- (ii) no hammering or chipping or other work capable of causing ignition is carried out;
- (iii) the undersides of aluminium gangways and other heavy aluminium structures, where contact with the vessel's steelwork is possible, are protected with hard plastic or wooden strips; and
- (iv) metallic connections between the berth and the vessel, e.g. mooring wires, are arranged to minimize the possibility of sparking where flammable atmospheres may be present.

55. The master should ensure that fire-fighting systems utilizing CO<sub>2</sub>, halon or steam are not used for inerting spaces containing flammable vapours, because of the danger of incendive static generation.

(c) *Restrictions on smoking, naked lights, electrical equipment, etc.*

(i) Designation of prohibited areas

56. The master should designate places on the vessel where smoking, naked lights, lighting, other electrical equipment (including communications equipment) and other sources of ignition are prohibited because of the possible presence of a flammable atmosphere or because flammable dangerous substances or explosives are handled in the vicinity. He should ensure that all sources of ignition are kept away from such places and that appropriate notices are displayed. This provision does not apply to signal lamps, portable lighting, battery operated hand lamps or other electrical equipment, including communications equipment, which are manufactured to conform to a recognized standard and approved as suitable for use in such conditions. For provisions for repair work see paragraphs 59-62.

(ii) Vessels carrying flammable liquids or liquefied flammable gases in bulk

57. Smoking and the use of naked lights should be completely prohibited in any vessel carrying in bulk flammable liquids or liquefied flammable gases, except in places specially designated by the master for that purpose. The master should ensure that:

- (1) doors or portholes in the designated smoking places do not open directly on to or over the cargo deck, or on to decks overlooking cargo spaces or ship-to-shore pipelines used for the transfer of flammable liquids or gases;
- (2) all portholes in the designated smoking places are kept closed, and doors into passageways are kept closed except when in use; and
- (3) matches and lighters are not carried in any part of the vessel where a flammable atmosphere may exist.

(iii) Loading, discharging, tank cleaning, etc

58. Before flammable liquids or liquefied flammable gases are loaded or unloaded by means of a pipeline, or tanks containing such substances are cleaned, gas-freed or inerted, or ballasting operations are carried out in tanks containing such substances or which have not been gas-freed, the master and berth operator should agree on the places designated as smoking places and should keep a written record of the agreement.

### **Repair work**

59. Routine maintenance other than welding, burning and riveting ("hot work") may be carried out in machinery spaces of a vessel carrying flammable liquids in bulk or flammable liquefied gas in bulk. Hot work should not be carried out in machinery spaces of such a vessel, nor in any compartment or tank in which, or adjacent to which, other dangerous substances are stowed, or which has not been freed of flammable gases or residue which might give rise to danger, unless the authority issuing permits has issued a permit authorising such repair work to be carried out. The permit should be displayed on the gangway or any place or means where persons embark or disembark from the vessel during the time the work is being done. Hot work should not be carried out in the vicinity of a vessel's pyrotechnic signals.

60. Before permitted hot work (other than routine maintenance in machinery spaces) as described in paragraph 59 above is carried out on board any vessel carrying liquid or liquefied dangerous substances in bulk, any vessel-to-shore pipeline used for loading and unloading such substances should be disconnected, and the open ends of pipelines of both vessel and shore sides of the vessel-to-shore connection should be blanked off after disconnection.

61. No repair work of any description, other than that required to be undertaken in an emergency, should be carried out on the cargo tanks, associated pipework, valves and ancillary equipment of a vessel carrying liquefied gas in bulk, except with the permission of the harbour master and, where appropriate, the berth operator. This provision does not apply where the vessel has been completely freed of gas and provided with a gas-free certificate.

62. Where hot work is being carried out in a space which has been gas-freed, it is necessary to ensure that such spaces remain gas-free, particularly whenever work is to recommence after a break. It is also necessary to guard against oxygen enrichment of a space when certain types of welding are carried out using cylinders of oxygen.

### **Restrictions on radio transmissions in harbour areas**

63. The master of a vessel in an area within 400 metres of the shore in a harbour area or within 400 metres of any jetty or mooring place designated by the harbour authority as a place where flammable liquids with a flash point of less than 23°C or flammable gases are handled or loaded in bulk should ensure that no communications transmitter operating on a frequency between 300kHz and 30MHz inclusive is used. VHF transmissions at or above 68MHz do not present a risk of ignition from transmitted power received by structures acting as aerials.

64. The transmissions from a vessel in any area in the port outside those described above should be operated on the minimum power required for effecting communication and should not exceed:

- (a) 1.4 kW peak on any frequency between 4 MHz and 30 MHz inclusive;
- (b) 0.4 kW peak power on any frequency between 1.6MHz and 3.8 MHz inclusive; or
- (c) 0.8 kW peak power on any frequency between 300kHz and 526.5 kHz inclusive.

65. Ship-borne radars with a peak pulse power output of up to 60kW do not present a risk of ignition from transmitted power received by structures acting as aerials. Ship-borne radar with a peak pulse power exceeding 60kW should not be used within 400 metres of a berth used for loading or unloading flammable liquids or gases in bulk.

66. The testing of a vessel's communication transmitter operating on a frequency between 300 kHz and 30 MHz in an area in which transmissions are prohibited under paragraph 63, or ship-borne radar with a peak pulse power exceeding 60 kW in an area in which transmissions are prohibited under paragraph 65, may be permitted by the harbour master. Communications transmitters may only be tested provided that a dummy load is used, with the aerial disconnected from the transmitter and connected to earth. If the jetty can be declared a gas-free area and there are no storage vessels or process plants within 400 metres of the jetty then test transmissions may be allowed during the period that the jetty is declared gas-free. Normal marine radar transmissions, i.e. 60kW or less, are not a source of ignition and there is no restriction on the testing of such equipment, provided that the associated electrical equipment (e.g. the aerial-rotation motor) does not present a source of ignition in a hazardous area.

### **Galley stoves and cooking appliances**

67. When a vessel is loading or unloading flammable liquids or flammable gases in bulk at a berth, the master should, before permitting the use of galley stoves and other cooking appliances, agree with the berth operator that no danger exists, taking into consideration the location, construction and ventilation of the galley. Care should be taken when making this judgement if the stern loading/unloading manifold is to be used to transfer cargo.

### **Ullaging and sampling**

68. Electrostatic charges may accumulate during the loading of liquids with conductivities of less than 100 pS/m. During, and for 30 minutes after, the completion of loading, metallic dipping, ullaging or sampling equipment should not be introduced into, or remain in, the tank. Metal equipment introduced into a tank after the 30 minute delay period should at all times be bonded and earthed to the structure of the ship. Operations carried out through sounding pipes are permissible at any time.

### **Electrical equipment**

69. All items of electrical equipment situated in an area where a flammable atmosphere may occur should be completely disconnected from any source of electrical supply, unless the equipment is approved as suitable for use in such conditions. The assessment of whether equipment is suitable should take into account any electrical connection that may be made to it on the vessel or on shore. In making or breaking any connection between ship and shore, attention should be paid to the possibility of sparks occurring.

*Note: Such sparking is more likely to occur on disconnection.*

## **Electrical connections between vessel and shore**

70. The master should ensure that:
- (a) before a circuit on board a vessel carrying dangerous substances is connected to an external electrical power supply, that part of the vessel's electrical circuit to be connected to the external supply is in good order, the equipment to be energized is compatible with the characteristics of the external supply, and suitable arrangements are made to prevent the external electrical supply being connected in parallel to the ship's electrical supply;
  - (b) before the external power supply is switched on, confirmation is given to the person in charge of the external electrical supply that the vessel's electrical system is in readiness to accept the external electrical supply; and
  - (c) means of isolating the vessel from the external electrical supply are provided in a readily accessible position on board the vessel, located immediately where the external electrical supply comes aboard the vessel.
71. Electrical connections between the shore and vessel should be kept to the minimum necessary for the proper functioning of the ship. Cables should be so placed and so constructed as to avoid the risk of physical damage. Earth conductors should be connected to the structure of the vessel.
72. Electrical cables and equipment used in zones where flammable atmospheres may occur should be of a type appropriate to the zone in question.

## **Fire-fighting facilities**

73. Masters should ensure that the ship's fire-fighting equipment is in good order and ready for immediate use. Where appropriate, for example for tankers loading or unloading flammable liquids or gases and for explosives, fire hoses should be unrolled and connected to the ship's rise main. The ship's fire-fighting arrangements, including any foam system, should be ready for immediate operation. Portable fire extinguishers, ready for immediate use, should be sited at strategic positions. Sufficient personnel for fire-fighting purposes should be available on board at all times, and a ready means of access for emergency services should be maintained.

附件 2  
ANNEX 2

Attention is drawn to the following internationally recognized codes and guides, which are of direct relevance to the safe transport, and handling of dangerous substances in port areas, and which may serve as additional sources of information:

- IMO International Maritime Dangerous Goods Code (IMDG Code).
- IMO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
- IMO Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk.
- IMO Code for Existing Ships Carrying Liquefied Gases in Bulk.
- IMO Code of Safe Practice for Solid Bulk Cargoes.
- IMO Emergency Procedures for Ships Carrying Dangerous Goods.
- IMO Guidelines for Inert Gas Systems.
- ICS/OCIMF/IAPH International Safety Guide for Oil Tankers and Terminals.
- ICS Tanker Safety Guide (Chemicals).
- ICS Tanker Safety Guide (Liquefied Gas).
- Code of Safe Working Practices for Merchant Seamen.