REPUBLIC **OF CYPRUS**

MINISTRY OF COMMUNICATIONS AND WORKS
DEPARTMENT OF MERCHANT SHIPPING
LEMESOS

Circular No. 20/2005 10 August 2005
TEN 4.7.22.07

To all Owners, Managers and
Representatives
of Ships under the Cyprus Flag

Subject: Cyprus Code of Safe Working Practices for Seafarers

I refer to the above subject and wish to inform you as follows:

1. The Republic of Cyprus has ratified the *ILO* Merchant Shipping(Minimum Standards) Convention,1976 (No.147). The relevant Ratification Law 13(III) of 1995, Part IV section 15, contains the following general provision with regard to the prevention of occupational accidents.

"It is the joint responsibility of the shipowner and the Master of every Cyprus sea-going ship to ensure that the necessary protective equipment is available and protection measures are taken and generally that the necessary actions under the provisions of the present Law and the Regulations issued by virtue thereof for the prevention of accidents and the protection of the health of the seafarers during the sea service on board ship, are taken."

2. The Department of Merchant Shipping in its effort to reduce occupational accidents and improve the well being of the seafarers on board Cyprus Flag vessels, prepared the Cyprus Code of Safe Working Practices for Seafarers. The *Code* provides guidance on how Ship Owners and Masters should meet their obligations mentioned above.

3. The *Code* is arranged in sections which deal with broad areas of concern.

The *introduction* gives the regulatory framework for health and safety on board ships and the overall safety responsibilities under that framework.

Section 1 is largely concerned with safety management and the duties underlying the advise in the remainder of the *Code*. All those working on board should be aware of these duties and of the principles governing the guidance on safe practice which they are required to follow.

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Section 2 begins with a Chapter setting out the areas that should be covered when introducing a new recruit to the safety procedures on board. It goes on to explain what individuals can do to improve their personal health and safety.

Section 3 is concerned with various working practices common to all ships.

Section 4 covers safety for specialised ship operations.

Appendix 1 lists Standards specifications referred to in the Code

Appendix 2 lists Cyprus legislation concerning Safety and Health at work

Appendix 3 contains Guidelines on Food and Water

4. At least one copy of the *Code* in either printed or digital form must be provided on every Cyprus registered vessel engaged in international voyages and also on every fishing vessel operating outside Cyprus territorial waters. Pleasure craft or ships which are not engaged in international voyages are not required to carry a copy of the *Code*, although the guidance it provides may be useful. The *Code* must be accessible to all Seafarers employed on board, who should be encouraged to read it.

5. For the time being, implementation of a Risk analysis program will be on a voluntary basis. In this respect, Shipping Companies wishing to demonstrate implementation of a Risk analysis program, for their ship board operations, once they succeed to achieve their goals and are prepared to share their experience and progress with regard to the prevention of the occupational accidents with our Department, will be rewarded with the posting of their company name on our web site with a relevant note referring to their effort to reduce occupational accidents and improve the well being of the seafarers.

6. Shipping companies which are willing to be enrolled in the Risk analysis program, should apply to Organizations authorized by DMS (see appendix 1), to provide them the tools to support and evaluate their self assessment program. These Organizations will issue to the successful companies a letter of compliance (see appendix 2) recommending their posting on our web site.

7. The *Code* can be downloaded free of charge, from our web site in either the printable or the digital version. The digital version contains cross links with the various chapters of the *Code*, links to *SOLAS* and *MARPOL* relevant regulations, *DMS* relevant Circulars, relevant *Legislation* and other relevant *Standards. In order* to be able to use the digital version the whole folder containing the pdf files should be downloaded on a computer's hard disk. Then, by opening the index file and using the links provided you should be able to navigate through the various chapters of the CODE.

S. S. Serghiou
Director
Department of Merchant Shipping

CC:Permanent Secretary, Ministry of Communications and Works
Permanent Secretary, Ministry of Foreign Affairs
Permanent Secretary, Ministry of Labour and National Insurance
Maritime Offices of the Department of Merchant Shipping abroad
Diplomatic Missions and Honorary Consular officers of the Republic
Cyprus Shipping Council
Cyprus Union of Shipowners
PEO Trade Union
SEK Trade Union
Cyprus Bar Association

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APPENDIX 1

1. **American Bureau of Shipping (ABS)**
2. **Bureau Veritas (BV)**
3. **China Classification Society (CCS)**
4. **Cyprus Bureau of Shipping (CBS)**
5. **Det Norske Veritas(DNV)**
6. **Germanischer Lloyd)GL)**
7. **Hellenic Register of Shipping (HRS)**
8. **Korean Register of Shipping (KRS)**
9. **Lloyd´s Register of Shipping (LRS)**
10. **Nippon Kaiji Kyokai (NKK)**
11. **Registro Italiano Navale (RINA)**
12. **Russian Maritime Register of Shipping (RS)**

APPENDIX 2

LETTER OF COMPLIANCE WITH VOLUNTARY ENROLMENT IN THE RISK ANALYSIS PROGRAM

A voluntary Risk Analysis Verification Program initiated by the Department of Merchant Shipping, aimed to verify compliance with the provisions of section 15 of part IV of the Law13(III),ratification Law of ILO Merchant Shipping (Minimum Standards) Convention,1976 (No.147),(hereafter referred to as the Convention)

ISSUED UNDER THE AUTHORITY OF THE REPUBLIC OF CYPRUS BY

……

(Full designation of the competent person or organization authorized under the provisions of the Convention)

Particulars of ship:

Name of Ship	Distinctive Number or Letters	Port of Registry	Gross Tonnage	IMO Number	Date of Construction

THIS IS TO CERTIFY:

1. That the above vessel has been assessed in accordance with a voluntary risk analysis verification program initiated by the Department of Merchant Shipping, aimed to verify compliance with the provisions of section 15 of part iv of the law13 (iii), ratification law of the ILO Merchant Shipping (Minimum standards) Convention, 1976(No.147), taking into account the "Cyprus Code of Safe Working Practices for Seafarers"

2. That the above vessel complies with the requirements of the Convention as regards the availability of necessary protective equipment and that the necessary preventive measures are taken for the prevention of occupational accidents and for the protection of the health of the seafarers during their sea service onboard.

This Letter of Compliance is valid until ……

Issued at …… the ……. Day of ……. 20……

……
For…….

CYPRUS CODE OF SAFE WORKING PRACTICES FOR SEAFARERS

Department of Merchant Shipping
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CYPRUS CODE OF SAFE WORKING PRACTICES FOR SEAFARERS

Section 3 Work Activities

PREFACE

This Code of Safe Working Practices is intended primarily for seamen on Cyprus registered vessels which go on international voyages, or, for fishing vessels, operating outside Cyprus territorial waters. It is not intended for seamen on pleasure craft, or ships which do not go on international voyages, although the guidance in it may be of use to them also.

Copies of the current edition of the Code must be carried on all Cyprus ships mentioned in the first sentence above, and a copy must be made available to any seaman in the ship who requests it. This Code is addressed to everyone on a ship regardless of rank or rating because the recommendations can be effective only if they are understood by all and if all co-operate in their implementation. Those not them selves actually engaged in a job in hand should be aware of what is being done, so that they may avoid putting themselves at risk or those concerned at risk by impeding or needlessly interfering with the conduct of the work.

The whole Code applies to ships subject to SOLAS (the Safety of Life at Sea Convention 1974, as amended). Its application to fishing vessels, and ships not subject to SOLAS –cargo ships below 500 gt (but which go on international voyages) is given at the start of each chapter.

The Code is arranged in sections which deal with broad areas of concern.

The introduction gives the regulatory framework for health and safety on board ships and overall safety responsibilities under that framework.

Section 1 is largely concerned with safety management and the duties underlying the advice in the remainder of the Code. All working on board should be aware of these duties and of the principles governing the guidance on safe practice which they are required to follow.

Section 2 begins with a Chapter setting out the areas that should be covered in introducing a new recruit to the safety procedures on board. It goes on to explain what individuals can do to improve their personal health and safety.

Section 3 is concerned with various working practices common to all ships.

Section 4 covers safety for specialist ship operations.

Appendix 1 lists Standards specifications referred to in the Code

Appendix 2 lists Cyprus legislation concerning Safety and Health at work

Appendix 3 contains Guidelines on Food and Water

Acknowledgement
This Code is an adaptation of the United Kingdom code of practice entitled *Code of Safe Working Practice* (copyright © 2003 HMSO) and is reproduced by permission.

DISCLAIMER

The use of this Code does not affect the responsibility of the ship operator to operate safely and to observe statutory requirements, or of any person to exercise the normal duty of care.

INTRODUCTION AND REGULATORY FRAMEWORK

Application of this Chapter to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

Paragraphs 9 and 10 (and the second sentence of paragraph 2) do not apply to these ships

General

1. Section 15 of the Convention on Merchant Shipping (Minimum Standards) of 1976 and Matters Connected Therewith Law of 1995 gives effect to the requirement in ILO Covention 147 on Minimum Standards on Merchant Ships that States have national laws equivalent to (among other matters) article 4 of the ILO Prevention of Accidents (Seafarers) Convention (No.134). The section states:

> "It is the joint responsibility of the shipowner and the master of every Cyprus sea-going ship to ensure that the necessary protective equipment is available and protection measures are taken and generally that the necessary actions under the provisions of the present Law and the Regulations issued by virtue thereof for the prevention of accidents and the protection of the health of the seafarers during the sea service on board ship, are taken.".

2. This Code contains guidance on how shipowners and masters should meet their obligations under that section. It is an applicable Code for the purposes of the International Safety Management (ISM) Code – see paragraphs 9 and 10 below.

3. Other Cyprus legislation which relates to particular aspects of safety and health at work is given in appendix 2.
This appendix also gives the corresponding to this legislation European Union Directives.
The Merchant Shipping (Safe Manning, Hours of Work and Watchkeeping) Law of 2000 (Law 105(I)/2000);
Inspection Regulation for Ships' Lifting Appliances and Elevators 2002 (see Merchant Shipping Circular 12/2002, of 29.04.2002).

4. In particular the following European Union Directives are directly relevant to safety and health issues on ships –
Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work.
Council Directive 90/269/EEC on the minimum health and safety requirements for the manual handling where there is a risk particularly of back injury to the workers.
Council Directive 89/656/EEC on the minimum health and safety requirements for the use by workers of personal protective equipment in the workplace.
Council Directive 92/58/EEC on the minimum requirements for safety and health signs.
Council Directive 2000/54/EEC concerning biological agents.
Council Directive 90/394/EEC, 99/38/EEC and 97/42/EEC on carcinogens.
Council Directive 89/655/EEC on minimum health and safety requirements for the use of work equipment by workers at work.

Council Directive 98/24/EEC, 91/322/EEC and 2000/39/EEC on chemical agents.
Council Directive 1999/92/EEC on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres.

Council Directive 90/270/EEC on minimum safety and health requirements for work with display screen equipment.
Council Directive 93/103/EEC on minimum safety and health requirements for work on board fishing vessels.
Council Directive 2002/44/EEC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration).
Council Directive 2003/10/EEC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise).
Council Directive 92/29/EEC on the minimum requirements on medical treatment on board vessels.

5. Council Directive 89/391/EEC of 11 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work (hereafter 'the Health and Safety Directive') sets basic requirements for the management of occupational health and safety. Employers are required to identify and assess the risks to health and safety of workers and anyone else affected by their activities, and to adopt appropriate measures to improve health and safety, in accordance with their findings.

6. The Code provides guidance on safe working practices for many situations that commonly arise on ships, and the basic principles can be applied to many other work situations that are not specifically covered. However, it should not be considered a comprehensive guide to safety, and the advice it contains should always be considered in conjunction with the findings of the employer's assessment of risks, and any information or working instructions provided by the manufacturer, supplier, or any other source, should be followed.

7. The Code should be supplemented by safety manuals, work instructions and other guidance issued by shipping companies for their particular ships, as appropriate.

8. Non-Cyprus ships are not subject to all Cyprus safety law. However section 15 of the Law referred to in paragraph 1 above does apply to them, and failure to meet international standards of safety enshrined in this Code may result in enforcement action while the ship is in Cyprus waters.

International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code)

9. All ships over 500GRT are required to operate a Safety Management System complying with the ISM Code.

10. Compliance with the ISM Code complements compliance with use of the guidance in this Code. For example,

The ISM Code requires that the Company's Safety Management System should "ensure that applicable Codes, guidelines and standards recommended by the … Administration" are taken into account. This Code is one such "applicable Code", and an ISM audit may consider how the guidance it contains has been implemented.

The ISM Code requires that the "safety management objectives of the Company should, inter alia, … establish safeguards against all identified risks…". This Code will assist the Company in identifying risks and establishing safe practices to safeguard against them.

The ISM Code requires the Company to "define and document the responsibility, authority and interrelations of all personnel who manage, perform and verify work relating to and affecting safety and pollution prevention". This Code gives advice on the roles of those with particular safety responsibilities, and highlights work areas where specific responsibilities should be allocated to a competent person.

The Health and Safety Legislation

11. It is the duty of employers to protect the health and safety of the workers and others so far as is reasonably practicable. The principles which employers must follow to effect this, are:

(a) the avoidance of risks, which among other things include the combating of risks at source and the replacement of dangerous practices, substances or equipment by non-dangerous or less dangerous practices, or equipment;

(b) the evaluation of unavoidable risks and the taking of action to reduce them;

(c) adoption of work patterns and procedures which take account of the capacity of the individual, especially in respect of the design of the workplace and the choice of work equipment, with a view in particular to alleviating monotonous work and to reducing any consequent adverse effect on workers' health and safety;

(d) adoption of procedures to take account of new technology and other changes in working practices, equipment, the working environment and any other factors which may affect health and safety;

(e) adoption of a coherent approach to management of the vessel or undertaking, taking account of health and safety at every level of the organisation;

(f) giving collective protective measures priority over individual protective measures;

(g) the provision of appropriate and relevant information and instruction for workers.

11. Risks inherent in the working environment must be identified, evaluated and in consequence measures must be taken such as to remove or minimise those risks, and so to protect workers and others from those which are unavoidable.

Duty holders under the Health and Safety Legislation

13. It is important that those on whom duties are placed are in a position to carry them out. Employment relationships on board ship can be complex – for example the master may not be employed by the owner or operator of the ship, or by the same employer as the crew. There may also be people working on board such as contractors and sub-

contractors, stevedoring companies and those under franchising arrangements (e.g. in retail or service outlets) whose employer has no direct responsibility for the safety of the ship. There is therefore no single "person" on whom it is appropriate to place the entire "employment" responsibility for health and safety on board.

14. This Code although recognises two levels of "employment" responsibility, "Company" and "employer", for onboard operations, the "Company" as stated on the ISM certificate is considered to be the "employer".

"Company" means the owner of a ship or any other organisation or person such as the manager, or bareboat charterer, who has assumed the responsibility for operation of the ship from the owner.

"employer" means a person by whom a worker is employed under a contract of employment;

"contract of employment" means a contract of employment, whether express or implied, and if express, whether oral or in writing.

15. Many aspects of the safety of the ship as a workplace (e.g. the structural soundness of the vessel, the provision of adequate lighting and ventilation, provision of life-saving appliances, and fire-fighting equipment) are under the control of the Company, either directly, or through their contractual arrangements with the owner.

16. Each employer, which may include franchise companies operating catering facilities or retail outlets, has control over the occupational health and safety training of the staff employed, and over everyday working practices.

17. The duties for each are explained below.

Duties of employers

18. All employers have a duty to ensure the health and safety of workers and others in accordance with the principles set out in paragraph 6 above.

The measures required include:

safe working places and environments;

safe and well maintained plant, machinery, equipment and tool;

safe use, handling, storage and transport of articles and substances.

health and safety training, instruction, supervision and information;

any necessary protective clothing and equipment where risks cannot be removed by any other means

a health , safety and welfare policy at work of all his employees;

assessment of the risks to the health and safety of workers and combating the risks at source;

replacing the dangerous risks by the non-dangerous or less dangerous;

information for workers about the significant findings of their risk assessment;

health surveillance of workers as appropriate;

information about their activities and staff to the Company;

appointment of a competent person to assist with the implementation of the Legislation;

consultation with their workers or elected representatives on health and safety matters.

Duties of the Company

19. In so far as the Company is an employer on board ship, it has a duty to assess the risks to workers and others affected by its activities. The Company's activity is the operation of the ship, and so it is responsible for co-ordinating the control measures identified in the risk assessment of all other relevant employers on board, as appropriate.

20. "The Company", in addition to its duties as an employer, is required to:

provide information on the special occupational qualifications required to any employment business supplying them with temporary workers;

consult other employers on board about the health and safety of workers;

co-ordinate health and safety measures between all the employers on board;

provide information to workers about the ship safety systems;

appoint a safety officer (where applicable);

organise the election of safety representatives and the operation of the safety committee (where applicable).

21. The Company is also responsible, under other merchant shipping legislation, for ensuring that emergency equipment is provided and emergency procedures are in place, including training all personnel in their emergency duties. Recommendations for basic shipboard health and safety training for workers new to a ship are given in Chapter 10.

22. As a general rule the master will be the representative of the Company on board ship.

Duties of Workers

23. Workers are required to:

take reasonable care for their own health and safety and that of others on board who may be affected by their acts or omissions;

co-operate with anyone else carrying out health and safety duties – including compliance with control measures identified during the employer's or Company's evaluation of risk;

report any identified serious hazards or deficiencies immediately to the appropriate officer or other authorised person;

make proper use of plant and machinery, and treat any hazard to health or safety (such as a dangerous substance) with due caution.

24. In sections 2 and 3 of this Code, the term "personnel" is used to refer to all workers on board, whether or not they are signed on as members of the crew. Where passengers are also covered, this will be specifically stated.

Carriage of the Code

25. Where there are 5 or fewer workers on board ship, one copy of this Code must be carried, in the custody of the master. The master shall ensure it is easily accessible and readily available to workers.

26. On passenger ships, the Company must ensure that at least 5 copies are carried on the ship of which –

(a) one copy shall be kept in the custody of the master;

(b) one copy shall be kept in the custody of the chief engineer;

(c) one copy shall be kept in the custody of either the purser or the catering officer;

(d) one copy shall be kept in the custody of the safety officer;

(e) one copy shall be kept in each mess room.

27. On other ships, where there are more than 5 workers, the Company must ensure that a suitable number of copies are carried on the ship of which –

(a) one copy shall be kept in the custody of the master;

(b) one copy shall be kept in the custody of the safety officer; and

(d) one or more copies shall be kept in a [place readily accessible to other workers] [each mess room];

provided that no person shall be required to hold more than one copy of the Code.

Standards

28. Appendix 1 contains a list of Standards referred to in the Code. References to *Cyprus* Standards (CYS), British Standards (BS), where there is no corresponding European Norm (CYS EN) contained in this Code are made with the understanding that "an alternative Standard which provides, in use, equivalent levels of safety, suitability and fitness for purpose" is equally acceptable.

29. Appendix 2 contains other Cyprus legislation which relates to particular aspects of safety and health at work.

Food and Water

30. Appendix 3 consists of Guidelines on food and water, giving guidance on how ship owners and masters should carry out their duties under sections 17 and 18 of the Act of 1995 referred to in paragraph 1 above. These Guidelines are applicable recommendations for the purpose of the ISM Code.

Section 1 - Safety Responsibilities/Shipboard Management

Chapter 1 - Risk Assessment

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to these ships. Note however that risk assessments do not have to be written, though DMS strongly recommend that they are.

1.1.1 Employers are required to ensure the health and safety of workers and other persons so far as possible, by the application of certain principles, including the evaluation of unavoidable risks and taking of action to reduce them.

1.1.2 Specifically, employers are required to make a suitable and sufficient assessment of the risks to health and safety of workers arising in the normal course of their activities or duties, for the purpose of identifying:

(a) Groups of workers at particular risk in the performance of their duties; and

(b) the measures to be taken to comply with the employer's duties;

The assessment should extend to others on board ship who may be affected by the acts or omissions of the employer.

1.1.3. Every employer and every self-employed person on board ship is required to inform the Company of any relevant risks to health and safety arising from the conduct of their business.

1.1.4. Employers must ensure that measures are taken to ensure an improvement in the safety and health of workers and other persons in respect of those risks identified by the assessment.

1.1.5 Employers must review the assessment when there is reason to believe that it is no longer valid, and make any necessary changes

1.1.6 Workers must be informed of any significant findings of the assessment and measure for their protection, and of any subsequent revisions made.

1.1.7 The Company is also required to ensure that anyone working on the ship, whether or not they are directly employed by the Company, is aware of the findings of the Company's risk assessment and of the measures taken for their protection.

1.1.8 This Chapter explains the principles of risk assessment in relation to occupational health and safety and provides some guidance on how the assessment and control of risks may be approached.

1.1.9 Regulation of occupational health and safety on board ship is of course not new. Existing safety measures may already provide a high level of safety for workers. For example, well-established procedures, inspections by safety officers and the use of "permits to work" which control safety conditions, will contribute to the identification of hazards and measures for safe working.

1.1.10 However, what is new is the explicit requirement in legislation for employers to adopt the risk assessment approach to occupational health and safety. This means that all work activities should be considered from a risk assessment standpoint.

1.1.11 Employers may adapt existing safety management systems to meet the risk assessment principles set out in section 1.3 and the main elements described in 1.10 taking into account the nature of their operations and the type and extent of the hazards and risks to workers.

1.2 Key terms

1.2.1 Key terms, used frequently in this Chapter, are defined below:

a) A **hazard** is a source of potential harm or damage or a situation with potential for harm or damage;

b) **risk** has two elements:

the likelihood that a hazard may occur;

the consequences of the hazardous event.

1.3 Principles of risk assessment

1.3.1 A "risk assessment" is intended to be a careful examination of what, in the nature of operations, could cause harm, so that decisions can be made as to whether enough precautions have been taken or whether more should be done to prevent harm. The aim is to minimise accidents and ill health on board ship.

1.3.2 The assessment should first establish the hazards that are present at the place of work and then identify the significant risks arising out of the work activity. The assessment should include consideration of the existing precautions to control the risk, such as permits to work, restricted access, use of warning signs or personal protective equipment.

1.3.3 Any risk assessment must address risks to the health and safety of workers. Advice on assessment in relation to the use of personal protective equipment, the use of equipment and manual handling operations are given in Chapters 4, 18, and 19. In addition, specific areas of work involving significant risk, and recommended measures to address that risk, are covered in more detail in Sections 3 and 4 of the Code.

1.4 Risk assessment in practice

1.4.1 There are no fixed rules about how risk assessment should be undertaken, although section 1.10 gives the main elements. The assessment will depend on the type of ship, the nature of operations and the type and extent of the hazards and risks. The intention is that the process should be simple, but meaningful. The following sections give advice on good practice.

1.5 What should be assessed?

1.5.1 The assessment should cover the risks arising from the work activities of workers on the ship. as well as the risks from work equipment and dangerous substances used on the ship. The assessment is not expected to cover risks which are not reasonably foreseeable.

1.5.2 Employers are advised to record the significant findings of their risk assessment. Risks which are found to be trivial, and where no further precautions are required, need not be recorded.

1.6 Who has to carry out the assessment?

1.6.1 In all cases, individual employers have responsibility for assessing the risks to their workers and other persons who may be affected by their activities. The Company will be responsible for co-ordinating the risk assessments covering everyone on the ship, including workers directly employed by itself, taking account of the other employers' assessments.

1.6.2 The process of risk assessment should be carried out by suitably experienced personnel, using specialist advice if appropriate.

1.7 How thorough should the assessment be?

1.7.1 A suitable and sufficient assessment must be made of the risks to the health and safety or workers arising in the normal course of their duties. This requirement to assess risk relates only to risks which arise directly from the work activity being undertaken and which have the potential to harm the person(s) actually undertaking that work, or those who may be directly affected by that work. The requirement to assess risk does not extend to any consequential peril to the ship resulting from the particular work activity, nor to any external hazards which may imperil the ship, either of which may cause harm to those on board or to others.

1.7.2 The assessment of risks must be 'suitable and sufficient'. The process need not be overcomplicated. This means that the amount of effort that is put into an assessment should depend on the level or risks identified and whether those risks are already controlled by satisfactory precautions or procedures to ensure that they are as low as reasonably practicable.

1.8 When to assess?

1.8.1 Risk assessment should be seen as a continuous process. In practice, the risks in the workplace should be assessed before work begins on any task for which no valid risk assessment exists. An assessment must be reviewed and updated as necessary, to ensure that it reflects any significant changes of equipment or procedure.

1.9 Risk assessment pro-forma

1.9.1 Employers may wish to use a simple pro-forma to record the findings of an assessment, covering, for example:

(a) work activity;

(b) hazard(s);

(c) controls in place;

(d) personnel at risk;

(e) likelihood of harm;

(f) severity of harm;

(g) risk levels (sometimes called “risk factor”);

(h) action to be taken following the assessment;

(i) administrative details, e.g. name of assessor, date, etc.

The examples at Annex 1.2 and Annex 1.3 illustrate a two stage approach, the first stage being to identify those risks which require further consideration and the second recording the assessment of those significant risks. This is a suggestion only, and is not intended to be prescriptive.

1.10 Elements of risk assessment

1.10.1 The main elements of the risk assessment process are:

(a) classify work activities;

(b) identify hazards and personnel at risk;

(c) determine risk;

(d) decide if risk is tolerable;

(e) prepare action plan (if necessary);

(f) review adequacy of action plan.

Further guidance on how each element may be accomplished is given in Annex 1.1,

Annex 1.1

GUIDANCE ON MAIN ELEMENTS OF RISK ASSESSMENT

1. Classify work activities

1.1 A useful preliminary to risk assessment is to identify separate work activities, to group them in a rational and manageable way, and to gather necessary information (or collate existing information) about them. Infrequent maintenance tasks, as well as day-to-day operations, should be included. Possible ways of classifying work activities include:

(a) department/location on board ship;

(b) stages of an operation or work routine;

(c) planned and unscheduled maintenance;

(d) defined tasks (e.g. loading/unloading cargo).

1.2 Information required for each work activity might include:

(a) tasks being carried out; their duration and frequency;

(b) location(s) where the work is carried out;

(c) who normally/occasionally carries out the tasks;

(d) others who may be affected by the work (e.g. contractors, passengers);

(e) training that personnel have received for the task.

2. Identify hazards

2.1 Asking these three questions should help to identify where there is a hazard:

Is there a source of harm?

Who (or what) could be harmed?

How could harm occur?

Hazards that clearly possess negligible potential for harm should not be documented or given further consideration, provided that appropriate control measures remain in place.

2.2 To help with the process of identifying hazards it may be useful to categorise hazards in different ways, for example by topic, e.g.:

(a) mechanical

(b) electrical

(c) physical

(d) radiation

(e) substances

(f) fire and explosion.

2.3 A complementary approach may be to develop a prompt list such as:

During work activities could the following hazards exist?

(a) slips/falls on the level;

(b) falls of persons from a height;

(c) falls of tools, materials, etc. from a height;

(d) inadequate headroom;

(e) inadequate ventilation;

(f) hazards from plant and machinery associated with assembly, commissioning, operation, maintenance, modification, repair and dismantling;

(g) hazards from manual handling.

The above list is not exhaustive, and employers could develop their own 'prompt list' taking into account the particular circumstances.

3. Determine risk

3.1 The risk from the hazard may be determined by estimating:

the potential severity of harm; and

the likelihood that harm will occur.

These two components should be judged independently.

3.2 When seeking to establish potential **severity of harm,** the following should be considered:

(a) part(s) of the body likely to be affected;

(b) nature of the harm, ranging from slightly to extremely harmful:

(i) slightly harmful, e.g.:

superficial injuries, minor cuts and bruises; eye irritation from dust;

nuisance and irritation (e.g. headaches); ill-health leading to temporary discomfort;

(ii) harmful, e.g.:

lacerations; burns; concussion; serious sprains; minor fractures; musculo-skeletal disorders;

deafness; dermatitis; asthma; work related upper limb disorders; ill-health leading to permanent minor disability;

(iii) extremely harmful, e.g.:

amputations; major fractures; poisonings; multiple injuries; fatal injuries;

occupational cancer; other severely life shortening diseases; acute fatal diseases.

3.3 In order to establish the likelihood of harm the adequacy of control measures already in place should be considered. Legal requirements and guidance in this Code and other safety publications are good guides to adequate control of specific hazards. The following issues should then typically be assessed:

(a) number of personnel exposed;

(b) frequency and duration of exposure to the hazard;

(c) effects of failure of power or water supply;

(d) effects of failure of plant and machinery components and safety devices;

(e) exposure to the elements;

(f) protection afforded by personal protective equipment and its limitations;

(g) possibility of unsafe acts by persons for example, who:

(i) may not know what the hazards are;

(ii) may not have the knowledge, physical capacity, or skills to do the work;

(iii) underestimate risks to which they are exposed;

(iv) underestimate the practicality and utility of safe working methods.

The likelihood of harm can be assessed as highly unlikely, unlikely, or likely.

3.4 Any given hazard is more serious if it affects a greater number of people. But some of the more serious hazards may be associated with an occasional task carried out by just one person, for example maintenance of inaccessible parts of lifting equipment.

4. Decide if risk is tolerable

4.1 Table 1 below shows one simple method for estimating risk levels and deciding whether risks are tolerable. Risks are classified according to their estimated likelihood

and potential severity of harm. However, employers may wish to develop other approaches according to the nature of their operations.

Table 1.

	Slightly Harmful	**Harmful**	**Extremely Harmful**
Highly unlikely	TRIVIAL RISK	TOLERABLE RISK	MODERATE RISK
Unlikely	TOLERABLE RISK	MODERATE RISK	SUBSTANTIAL RISK
Likely	MODERATE RISK	SUBSTANTIAL RISK	INTOLERABLE RISK

Note: Tolerable here means that the risk has been reduced to the lowest level that is reasonably practicable

5. Prepare risk control action plan

5.1 Having determined the significant risks, the next step is to decide what action should be taken to improve safety, taking account of precautions and controls already in place.

5.2 Risk categories form the basis for deciding whether improved controls are required and the timescale for action. Table 2 suggests a possible simple approach. This shows that the effort made to control risk should reflect the seriousness of that risk.

Table 2.

	ACTION AND TIMESCALE
TRIVIAL	No action is required and no documentary records need be kept
TOLERABLE	No additional controls are required. Consideration may be given to a more cost effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained.
MODERATE	Efforts should be made to reduce the risk, but the costs of prevention should be carefully measured and limited. Risk reduction measures should be implemented within a defined time period. Where the moderate risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures.
SUBSTANTIAL	Work should not be started until the risk has been reduced. Considerable resources may have to be allocated to reduce the risk. Where the risk involves work in progress, urgent action should be taken.
INTOLERABLE	Work should not be *started or continued* until the risk has been reduced. If it is not possible to reduce the risk even with unlimited resources, work has to remain prohibited.

Note: Tolerable here means that the risk has been reduced to the lowest level that is reasonable practicable.

5.3 The outcome of a risk assessment should be an inventory of actions, in priority order, to devise, maintain or improve controls.

5.4 Controls should be chosen taking into account the following which are in order of effectiveness:

(a) if possible, eliminate hazards altogether, or combat risks at source e.g. use a safe substance instead of a dangerous one;

(b) if elimination is not possible, try to reduce the risk e.g. where risk is of electricution, by using a low voltage electrical appliance;

(c) where possible adapt work to the individual, e.g. to take account of individual mental and physical capabilities;

(d) take advantage of technical progress to improve controls;

(e) give precedence to measures that protect everyone;

(f) if necessary, use a combination of technical and procedural controls;

(g) introduce or ensure the continuation of planned maintenance, for example, of machinery safeguards;

(h) ensure emergency arrangements are in place;

(i) adopt personal protective equipment only as a last resort, after all other control options have been considered.

5.5 In addition to emergency and evacuation plans (see Chapter 10), it may be necessary to provide emergency equipment relevant to the specific hazards.

6. Review adequacy of action plan

6.1 Any action plan should be reviewed before implementation, typically by asking:

(a) will the revised controls lead to tolerable risk levels?

(b) are new hazards created?

(c) what do people affected think about the need for, and practicality of, the revised preventive measures?

(d) will the revised controls be used in practice, and not ignored in the face of, for example, pressures to get the job done?

Annex 1.2

INITIAL RISK ASSESSMENT

Name of Ship

Record No.

Work Area being assessed

Significant risks identified

Task ID number	Work process/action undertaken in area	Hazard associated with activity	Controls already in place	Significant risks identified	Further assessment required (Y/N)

Declaration: Where no significant risk has been listed, we as assessors have judged that the only risks identified were of an inconsequential nature and therefore do not require a more detailed assessment.

Signed

Annex 1.3

DETAILED RISK ASSESSMENT

Name of Ship

Record No.

	Hazards
Hazard No.	**Description**
1	
2	
3	
4	
5	
6	
7	
People at risk	
	Existing control measures
Hazard No.	**Control measures**
1	
2	
3	
4	
5	
6	
7	

Assessment of Risk

Degree/likelihood	Slightly harmful	Harmful	Extremely harmful
	Risk Factors		
Highly unlikely	Trivial risk	Tolerable risk	Moderate risk
Unlikely	Tolerable risk	Moderate risk	Substantial risk
Likely	Moderate risk	Substantial risk	Intolerable risk

To assess the risk....

1 Select the expression for likelihood which most applies to the hazard;

2 Select the expression for degree of harm which most applies to the hazard;

3 Cross reference using the above table to determine the level of risk.

Hazard No.	**Likelihood of occurrence**	**Hazard severity**	**Risk factor**
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Additional control measures

Hazard No.	Further action necessary to control risk	Remedial Action Date	Date Completed
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Additional Comments

Assessment review date

Annex 1.4

GUIDANCE / STEPS OF RISK ASSESSMENT WITH EXAMPLES

1. CLASSIFY WORK ACTIVITIES

The object of doing the risk assessment is to identify any areas or activities that may place the health and safety of others at risk. It will help to decide if improvements or precautions can reasonably be made.

It is not a test of 'How Safe is the Vessel'

It is a requirement, under the ***CYPRUS CODE OF SAFE WORKING PRACTICES FOR SEAFARERS,*** that you carry out risk assessments and consult and inform the crewmembers of the findings.

No inspection will be made, other than to check that risk assessments have been carried out. Hence, you should not try to make the risks on the vessel to appear less than they truly are.

The object is to ensure that the work situation is safe for all persons involved **"so far as is reasonably practicable"**.

"Reasonably practicable" means what the average 'reasonable person' would consider to be sensible when considering the risk involved, balanced against the cost (whether in money, time or trouble) to avoid the risk.

In order to make work situations safe it is necessary to think of the dangers or hazards that are possible and to try to prevent or protect against them. This is known as 'risk assessment' and people are doing it informally all the time, making judgments, "Weighing the job up".

To complete the assessment you need to consider how likely it is that harm will actually occur from the possible hazard and how harmful the consequences could be.

Terms Used

"Hazard": An object or situation, which may cause harm.

"How Likely" (L): How likely it is that harm will actually occur considering how often involvement with the hazard occurs, the existing safeguards, the experience and training of persons and the number of persons involved and other factors such as weather and working conditions.

"Consequences": The possible outcome of the hazard.

"How Harmful (H)": How harmful the consequences may be.

"Risk": A combination of 'how likely' and 'how harmful'. Obviously, something that is very likely to happen is a greater risk than something which is highly unlikely. However, in assessing the risk, the severity of the possible consequences is of major importance. Something that is unlikely but could result in the loss of life is a bigger risk than something that is likely to happen but has only minor consequences.

"Control Measure": What you intend to do about the risk.

2. IDENTIFY HAZARDS (AND POTENTIAL ACCIDENTS)

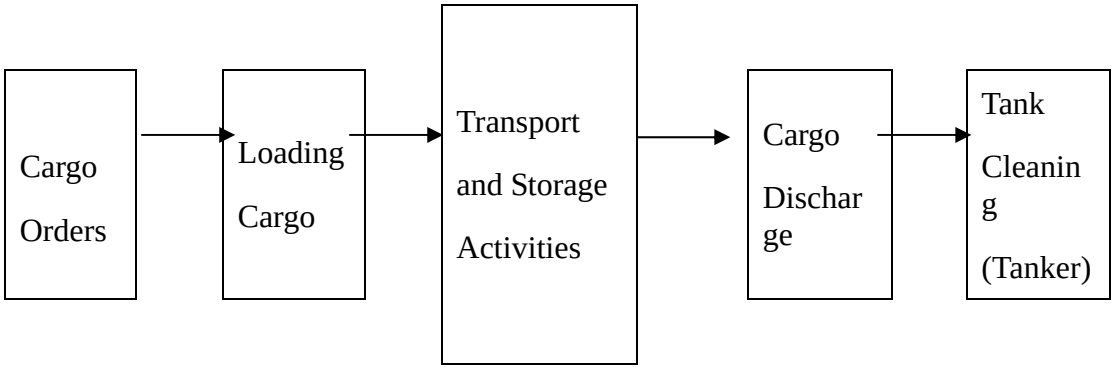
What can go wrong?

Once you've defined the scope of this process (Above paragraph 1) you can get into the more specific aspects of the assessment. Ask yourself, "What can go wrong?"

Develop a list of hazards and related accidents that could occur. Do not limit yourself to only those accidents that have historically occurred. An example chart of hazards and potential accidents is as follows:

HAZARD	**ACCIDENT**
Operations in restricted waterways or near exposed reef	Groundings Bottom scouring
Bad weather	Loss of crew overboard Damage to vessel
Handling toxic substances	Spill Personnel exposure Improper waste handling
Hot work started without authorization	Fire Injury to personnel Vessel damage
Etc.	Etc.

One way to identify hazards and their associated accidents is to develop a flow chart of the operation(s) you have decided to assess. List or describe each function or activity being performed (within your specific area of concern). These functions or activities will be sequential in nature and usually follow a timeline. This flowchart will give you a relatively broad picture of the operation. Suppose you decide to examine only the portion of your operation when you are carrying hazardous cargo and you are concerned about personnel exposure. A flow chart that might apply in this case is presented below:



Here is a partial listing of potential hazards and accidents to consider. Depending upon the problem you have defined, additional hazards may need to be added.

Personnel Casualties:

Crew injury involving machinery

Crew injury while alongside or getting underway (e.g., line handling injuries, dock-jumping injuries, falling into water)

Man overboard

Medical emergency

Crew violence

Slips, trips, and falls

Material Casualties – Ship:

Impact with a fixed object)

Collision due to inattention

Collision due to mechanical failure

Collision due to other ship's fault

Drift grounding caused by mechanical failure

Engine room / machinery space fire

Explosion on board

Galley fire

Hard docking resulting in damage

Powered grounding

Other shipboard fire

Material Casualties – Shore:

Explosion in terminal

Fire in terminal

Structural damage to terminal due to ship collision

Fire on vessel

Hose failures

Seal and flange separations

Environmental Impacts:

Bottom scouring

Exhaust emissions

Hazardous material discharge

Noise

Pollution due to oil discharge

Sewage discharge

Vapour cloud release

Cargo emissions

Human Errors:

Inattention

Failure to follow procedures

Improper maintenance

Inadequate training

Fatigue

In the spaces provided on the ***"Risk Assessment Worksheet"*** as shown in the example below**,** describe the hazards and potential accidents that could occur together with the existing control measures onboard.

HAZARD No	**HAZARDS DESCRIPTION**
1.	Boarding and leaving the vessel / Use of ladder or gangway. Falling onto vessel or into water – serious injuries or death
2	Boarding and leaving the vessel / Use of ladder or gangway. Falling onto vessel or into water – serious injuries or death
3	General working in exposed conditions / Falling overboard / Drowning
People at risk	Crewmembers, Visitors, Repair-team etc.
HAZARD No	**EXISTING CONTROL MEASURES**
1	Ladder or Gangway in good order
2	Ladder or Gangway damaged
3	Ropes, rails, lifejackets, lifebuoy etc.

3. ASSIGN LIKELIHOOD (FREQUENCY)

At this point, you are ready to discuss and establish a likelihood (frequency) scale. For each hazard and its associated potential accident identified in the previous step, rate the likelihood of that hazard leading to an accident. How often might it happen?Note that this is an estimate of how often the potential accident could *possibly* occur, not how often a hazard presents itself. Just because you may encounter a certain hazardous situation every day does not mean that you will experience its associated accident every day.

Decide how likely (frequently) each of the hazards and undesirable events listed in previous Paragraph 2 (IDENTIFY HAZARDS AND POTENTIAL ACCIDENTS) could become reality and cause harm considering how often involvement with the hazard occurs, the existing safeguards, the experience and training of crewmembers and the number of crewmembers involved and other factors such as weather and working conditions. Discuss each hazard and event and rate it using the Table 1 below:

TABLE 1	
ASSIGN A RATING OF	IF THE LIKELIHOOD (FREQUENCY) IS (L)
1	Highly Unlikely (For example might occur every five – ten years or once in a lifetime)
2	Unlikely (For example might occur every one to five years)
3	Likely (For example might occur more than once per year)

When rating your group of hazards and potential accidents, compare them to one another to ensure consistency. You may have refined your ideas about the rating scheme in the middle of this step. Thus, some ratings may need to be adjusted to make them consistent with your new ideas. To aid in the assignment of frequency ratings, review the historical performance of the Company / Ship. These ratings will be used later in Paragraph 5 to help determine which hazards and their related accidents pose the greatest risks.

4. ASSIGN CONSEQUENCE (IMPACT, POTENTIAL SEVERITY OF HARM)

What is the impact?

In addition to the frequency scale that you just created as above, you must also establish a consequence or impact (potential severity of harm) scale. For each hazard and potential accident identified in above Paragraph 2 (IDENTIFY HAZARDS AND POTENTIAL ACCIDENTS) rate the impact that would result

from that hazard materializing into an accident. Once again, discuss each hazard and event and rate them using Table 2.

TABLE 2	
ASSIGN A RATING OF	IF THE IMPACT COULD BE (H)
1	Slightly Harmful
2	Harmful
3	**Extremely Harmful**

Definitions of “How Harmful” (H)

Slightly Harmful (1), e.g.:

Superficial injuries, minor cuts and bruises, eye irritation from dust

Nuisance and irritation (e.g. headaches), ill-health leading to temporary discomfort

Harmful (2), e.g.:

Lacerations, burns, concussion, serious sprains, minor fractures, musculo-skeletal disorders

Deafness, dermatitis, asthma, work related upper limb disorders, ill-health leading to permanent minor disability

Extremely Harmful (3), e.g.:

Amputations, major fractures, poisonings, multiple injuries, fatal injuriesOccupational cancer, other severely life shortening diseases, acute fatal diseases

5. DETERMINING RISK FACTOR (LEVEL, PRIORITY)

Decide if Risk is Tolerable (Tolerable here means that the risk has been reduced to the lowest level that is reasonable practicable)!

Where should efforts be focused?

Now that the **“Likelihood (Frequency)”** and **“Consequence”** of each hazard and potential accident have been rated, the ratings can be used to determine relative risk priority scores. These risk priority scores will identify which hazards present the greatest risks for the operation being examined.

Use Table 3 below, to determine the risk priority score for each hazard. First, locate the **“Likelihood (Frequency)”** rating from **Table 1** in the leftmost column.

Then locate the **"Consequence"** rating from **Table 2** in the uppermost row. The **"Risk Factor (Level, Priority)"** score is defined as **LxH** and will fall into one of the following five general groups: **TRIVIAL (1), TOLERABLE (2), MODERATE (3 / 4), SUBSTANTIAL (5) and INTOLERABLE (9).**

TABLE 3							
LIKELIHOOD (FREQUENCY) (L)		**CONSEQUENCE (H)**					
		1	**Slightly Harmful**	**2**	**Harmful**	**3**	**Extremely Harmful**
		RISK FACTORS (LxH)					
1	Highly Unlikely	**1**	Trivial Risk	**2**	Tolerable Risk	**3**	**Moderate Risk**
2	Unlikely	**2**	**Tolerable Risk**	**4**	**Moderate Risk**	**6**	Substantial Risk
3	**Likely**	**3**	**Moderate Risk**	**6**	**Substantial Risk**	**9**	**Intolerable Risk**

Definitions of "RISK FACTORS (LxH)":

TRIVIAL (1): No action is required and no documentary records need be kept

TOLERABLE (2): No additional controls are required. Consideration may be given to a more cost effective solution or improvement that imposes no additional cost burden. Monitoring is required to ensure that the controls are maintained

MODERATE (3 / 4): Efforts should be made to reduce the risk, but the costs of prevention should be carefully measured and limited. Risk reduction measures should be implemented within a defined time period. Where the moderate risk is associated with extremely harmful consequences, further assessment may be necessary to establish more precisely the likelihood of harm as a basis for determining the need for improved control measures

SUBSTANTIAL (6): Work should not be started until the risk has been reduced. Considerable resources may have to be allocated to reduce the risk. Where the risk involves work in progress, urgent action should be taken

INTOLERABLE (9): Work should not be *started or continued* until the risk has been reduced. If it is not possible to reduce the risk even with unlimited resources, work has to remain prohibited

6. SUMMARY OF DOING RISK ASSESSMENT

Doing the risk assessment is straightforward; simply consider each of the hazards as they exist on the vessel.

How likely (L) is it to cause harm? Is it: **Highly Unlikely (1), Unlikely (2)** and **Likely (3).** Enter the appropriate number in the relevant column.

Consider the how harmful the consequences (H) may be: **Slightly Harmful (1), Harmful (2)** and **Extremely Harmful (3).** Enter the appropriate number in the relevant column.

Multiply **L x H** to obtain a **Risk Factor** and then refer to the risk factor Table 3 to see if you need to take action.

Decide on the action you will take and note it briefly in the control measures column. If no action is necessary, briefly note why.

INITIAL RISK ASSESSMENT					
Name of Ship:M/V ´´XXXX´´		Record No. 01/2005		Work Area being assessed: Deck	
Task ID No	**Work Process / Action undertaken in area**	**Hazard associated with activity**	**Controls already in place**	**Significant risks identified**	**Further assessment required (YES / NO)**
1.	Painting over the side of the Ship	Fall into water and possible drowning	Ropes are free from damage Rope ladder is free from damage Fastening of ropes and ladder is in order Inflatable lifejacket must be used Line with life-buoy attached rigged where the life-buoy floats in the water	None	NO
2.	Provisioning over gangway	Fall from the gangway and end up between ship's side and the dockside	Gangway is fastened securely on board and on the dock Handrails and safety nets have been rigged Line with life-buoy has been rigged where the life-buoy floats in the water underneath the gangway Inflatable life-jacket ready to be used	None	NO

Declaration: Where no significant risk has been listed, we as assessors have judged that the only risks identified were of an inconsequential nature and therefore do not require a more detailed assessment.

Signed

DETAILED RISK ASSESSMENT WORKSHEET

COMPANY: XXXXXXXXXXXXXXXX	**NAME OF SHIP:** WWWWWWWW
RECORD No: 01 / 2005	**DATE OF ASSESSMENT:** **D**D/MM/YY

PARTICIPANTS

NAME	TITLE / ORGANIZATION	SIGNATURE
AAAAAAAAAAAAA	ASSESSOR	
BBBBBBBBBBBBB	CAPTAIN	
CCCCCCCCCCCCC	CHIEF ENGINEER	

HAZARD No	**HAZARDS DESCRIPTION**
1.	Boarding and leaving the vessel / Use of ladder or gangway. Falling onto vessel or into water – serious injuries or death
2	Boarding and leaving the vessel / Use of ladder or gangway. Falling onto vessel or into water – serious injuries or death
3	General working in exposed conditions / Falling overboard / Drowning
People at risk	Crewmembers, Visitors, Repair-team etc.
HAZARD No	**EXISTING CONTROL MEASURES**
1	Ladder or Gangway in good order
2	Ladder or Gangway damaged
3	Ropes, rails, lifejackets, lifebuoy etc.

To assess the risk:

1. Select the expression for **Likelihood (L)** which most applies to the hazard;

2. Select the expression for **Consequence (H)** (Degree of Harm) which most applies to the hazard;

3. Cross reference using the above table to determine the **Risk Factor (LxH)** (Level of Risk).

(Assessor's Note: In other words use Table 3 as below)

TABLE 3							
LIKELIHOOD (FREQUENCY) (L)		**CONSEQUENCE (H)**					
		1	**Slightly Harmful**	**2**	**Harmful**	**3**	**Extremely Harmful**
		RISK FACTORS (LxH)					
1	Highly Unlikely	**1**	Trivial Risk	**2**	Tolerable Risk	**3**	**Moderate Risk**
2	Unlikely	**2**	**Tolerable Risk**	**4**	**Moderate Risk**	**6**	Substantial Risk
3	**Likely**	**3**	**Moderate Risk**	**6**	**Substantial Risk**	**9**	**Intolerable Risk**

HAZARD NO.	**LIKELIHOOD OF OCCURRENCE (L)**	HAZARD SEVERITY **CONSEQUENCES (H)**	RISK FACTOR **(LxH)**
1	**1**	**3**	**3**
Assessor's notes:			
	Considering a ladder *or gangway* that is in *good order.* *Because the ladder or gangway is in good condition, it* ***is Highly Unlikely*** *that anyone will fall* Enter 1 in 'L' column	*The consequence of a fall could be fatal, very harmful. Enter 3 in 'H' column*	*Take action but subject to it being reasonable and* *sensibly possible. Although a ladder or gangway will always present a risk, there is no other reasonable and sensible means of boarding the vessel*
2	**2**	**3**	**6**
Assessor's notes:			
	Considering a ladder or gangway that is damaged. *Say, it's bent halfway down, or there are no suitable hand holds at the top.* *The damage is such that it is still* ***Unlikely*** *that anyone will fall.* *Enter 2* *in 'L' column.* *(Note: if the ladder*	*The consequences of a fall could be fatal, very harmful. Enter 3 in 'H' column*	*Must attend to the hazard and reduce the risk. If there is no option but to continue to use* *the ladder or gangway, the crew must be cautioned to take the greatest care.* *Note: if the ladder or gangway was severely damaged, which would necessitate 3 in the L* *column, L x H would then be 9.*

	or gangway is severely *damaged it would then be **Likely** that someone would fall).*		*This would require the* *ladder or gangway not to be used at all,* *until repairs had been made.*
3	**2**	**3**	**6**
Assessor's notes:			
	For example painting over the side of the ship. *Rope ladder is not free from damage.* *Category **Unlikely** is appropriate.* *Enter 2 in "L" column*	*The consequence may be fatal (Falling overboard and maybe drowning)* ***Extremely Harmful**.* *Enter 3 in 'H' column*	*A risk factor of 6 must be attended to reduce the risk.*

Additional control measures

HAZARD NO.	FURTHER ACTION NECESSARY TO CONTROL RISK	REMEDIAL ACTION DATE	DATE COMPLETED
1	The Ladder or Gangway is in good order. No further action needed	N/A	N/A
2	Take relevant actions to repair the damaged ladder or gangway. Crew warned of danger.	Immediately	DD/MM/YY
3	Rope ladder to be repaired. Ropes to be free from damage. Fastening of ropes and ladder to be in order Inflatable lifejacket must be used. Line with lifebuoy attached rigged where the lifebuoy floats in the water.	Immediately	DD/MM/YY

Additional Comments

Assessment review date

Chapter 2 - Health Surveillance

2.1 Duty of employers
2.2 Purpose of health surveillance
2.3 Application
2.4 What to do

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter does not apply to these ships

Chapter 2 - Health Surveillance 2.1 Duty of employers

2.1.1 Employers must provide workers with such health surveillance as is appropriate taking into account the risks to their health and safety which are identified by the assessment undertaken.

2.2 Purpose of health surveillance

2.2.1 Health surveillance is a mean of identifying early signs of ill health caused by occupational hazards so that action can be taken to protect individuals at an early stage from further harm, for example:

where a worker's exposure to a hazardous substance is approaching the agreed limit, the worker should be removed from exposure before any harm is done;

if symptoms of minor ailments (e.g. skin rash) are detected, action should be taken to prevent them becoming major health problems.

2.2.2 In addition, the results of health surveillance can provide a means of:

(a) checking the effectiveness of health control measures;

(b) providing feedback on the accuracy of health risk assessment;

(c) identifying and protecting individuals at increased risk.

2.2.3 Health surveillance is not a substitute for measures to control risks to health and safety. Control measures should always be the first consideration to reduce risk. Nor is it the same as medical examinations which are intended to assess fitness for work (for example, pre-employment, sickness resumption or periodic examinations). However, where relevant, health surveillance should be conducted, for example at pre-employment assessment, where a base-line reference can usefully be established.

2.3 Application

2.3.1 Health surveillance should be introduced where risk assessment (see Chapter 1) identifies that:

(a) a particular work activity may cause ill health;

(b) an identifiable disease or adverse health condition is related to the work;

(c) recognised testing methods are available for early detection of an occupational disease or condition – e.g. audiometry , skin inspection where dermatitis is a hazard;

(d) there is a reasonable likelihood that a disease or condition may occur in relation to particular working conditions;

(e) surveillance is likely to further the protection of workers' health.

2.3.2 All workers should be subject to whatever health surveillance is appropriate for the work activities they are involved in. Examples of circumstances in which it may be useful include:

exposure to hazardous substances;

working with vibrating tools;

exposure to high levels of noise;

use of substances known to cause dermatitis (e.g. solvents) and

exposure to certain dusts (e.g. asbestos).

2.4 What to do

2.4.1 Once it is decided that health surveillance is appropriate, it should be maintained whilst the worker remains exposed to the hazard(s) in question. A worker's health surveillance record should where possible be retained, even when the worker changes employment.

2.4.2 Health surveillance may involve one or more of the following, as applicable:

(a) inspection of readily detectable conditions (e.g. skin damage) by a person acting within the limits of their training and experience;

(b) enquiries about symptoms;

(c) hearing checks (audiometry);

(d) medical examinations or company health checks;

(e) testing blood or urine samples.

2.4.3 The frequency of such checks should be determined either on the basis of suitable general guidance (e.g. skin inspection for skin damage) or on the advice of a qualified occupational heath practitioner. The workers concerned could be given an explanation of the purpose of health surveillance and an opportunity to comment on the proposed frequency of such health surveillance procedures, either directly or through their safety representatives.

2.4.4 Where medical surveillance is required, and it is necessary to take samples or record other personal information, it is essential that confidentiality is maintained in respect of individual health records containing clinical information.

Chapter 3 - Safety officials

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

3.1 Introduction

3.1.1 Every person on board has a responsibility for safety.

The Company is responsible for ensuring the overall safety of the ship and that safety on board is properly organised and co-ordinated.

The master has the day to day responsibility for the safe operation of the ship and the safety of those on board.

Each employer is responsible for the health and safety of his workers.

Heads of department are responsible for health and safety in their own department.

Each officer/manager is responsible for health and safety for those they supervise and others affected.

Each individual worker is responsible for his own health and safety and that of anyone affected by what he does or fails to do.

In this Chapter, those with a designated safety role on board are referred to as "safety officials", and this term includes safety officers, safety representatives and other members of safety committees.

3.1.2 The development of a "safety culture" and the achievement of high standards of safety depend on good organisation and the whole-hearted support of management and all personnel. Those with specific safety responsibilities are more likely to perform well

when management is clearly committed to health and safety. It is also important that procedures are in place so that all personnel can co-operate and participate in establishing and maintaining safe working conditions and practices.

3.1.3 Sections 3.2, 3.8.5 and 3.13 of this Chapter apply equally on all ships, whether or not safety officials are appointed or elected by law.

3.1.4 Sections 3.3. – 3.11 however apply only where safety officials are appointed or elected as required by law. The information and guidance here is designed to assist them in their primary objective of reducing the number of deaths and injuries, and to advise Companies and masters how to fulfil their duty to assist them.

3.2 Employer duties

3.2.1 Every employer is required to appoint one or more competent persons to promote health and safety in their undertaking. On board some large ships, where there are personnel working who are employed by several different employers, each employer must appoint (a) competent person(s). They do not have to work on the ship themselves, but to be "competent" for the task they should have a knowledge of the duties undertaken by those for whom they are responsible, and should ensure that any specific risks encountered as a result of that particular working environment are dealt with appropriately – e.g. by checking that the company has adequate safety procedures for all on board, and by co-ordinating risk assessments with the company.

3.2.2 The employer may "appoint" himself where, in a small organisation there is no one else available to take on this responsibility. Alternatively, he may employ someone from outside his own undertaking to advise on health and safety, provided that person is competent. This requirement applies whether or not a safety officer is appointed for the ship by the Company.

3.2.3 The employer must provide the competent person(s) with all relevant information they need to do their job. This would include a copy of the employer's safety policy and risk assessments, information about the duties of personnel, and any information provided by other employers about risks and safety procedures in share work-places.

3.2.4 The employer is required to consult workers or their elected representatives on health and safety matters, in particular.

(a) Arrangements for the appointment of a competent person;

(b) the findings of the risk assessment;

(c) arrangements for health and safety training; and

(d) the introduction of new technology.

The matters to be discussed might also include selection of work equipment and/or protective clothing and equipment, installation of safety signs and follow-up to accidents and other incidents.

3.2.5 Workers or their elected representatives must be allowed to make representations to their employer about health and safety matters without disadvantage to themselves. Such representations should be given adequate consideration, perhaps in conjunction with the safety committee, and any agreed measures to improve safety implemented as soon as reasonably practicable.

3.2.6 It is also the employer's responsibility to ensure that workers or their elected representatives have access to relevant information and advice about health and safety matters from inspection agencies and health and safety authorities, and, from their own records, about accidents, serious injuries and dangerous occurrences.

3.2.7 Employers must provide elected representatives adequate time off normal duties, without loss of pay, to enable them to exercise their rights and carry out their function effectively. Workers' safety representatives must not suffer any disadvantage for undertaking this function.

Company duties

3.3 General

3.3.1 The parts of this Code dealing with safety officials lay duties on the Company for the appointment of ships' safety officers (see sections 3.4 and 3.10 of this Code), the appointment of a safety committee (section 3.6) and the election of safety representatives with specified powers (section 3.5).

3.3.2 Sections 3.4, 3.5 and 3.6 below apply only to ships (other than fishing vessels) on which more than five workers are employed.

3.3.3 The Department of Merchant Shipping may grant ad hoc exemptions to specific ships or classes of ships subject to any relevant special conditions. An example might be a multi-crew ship with alternate crews working on a regular ship basis. In considering a request for exemption, the Department of Merchant Shipping would require to be satisfied that alternative arrangements existed, and would make it a condition of the exemption that these were continued.

3.3.5 Even where there is no requirement for the election of safety representatives and safety committees, the employer is required to consult workers on health and safety issues

3.4 Appointment of Safety Officers

3.4.1 On every sea-going ship on which more than five workers are employed, the Company is required to appoint a safety officer. The master must record the appointment of a safety officer – this should be recorded in the official logbook.

3.4.2 The safety officer is the safety adviser aboard the ship and can provide valuable assistance to the Company and to individual employers in meeting the statutory responsibilities for health and safety. He should have attended a suitable Safety Officer's training course. He should be familiar with the principles and practice of risk assessment, and should be available to advise those preparing and reviewing risk assessments. It is

recognised that, where the safety officer also has other responsibilities (e.g. chief officer) he may well conduct risk assessments himself. However, the general principle is that the safety officer takes an independent view of safety on behalf of the Company.

3.4.3 Although not prohibited the appointment of the master as the safety officer is not generally advisable. This is because the safety officer is required amongst his other duties to make representations and recommendations on health and safety to the master.

3.4.4 If possible, the Company should avoid appointing as safety officer anyone to whom the master has delegated the task of giving medical treatment. This is because of the duties of the safety officer is to investigate incidents, and he would not be able to give proper attention to this function while providing medical treatment for any casualties.

3.5 Election of Safety Representatives

3.5.1 On every ship on which more than five workers are employed, the Company must make arrangements for the election of safety representatives. The legislation specify that no safety representatives may have less than 2 years consecutive sea service since attaining the age of 18, which in the case of a safety representative on board a tanker shall include at least 6 months service on such a ship.

3.5.2 The Company must make rules for the election of safety representatives by the workers on board and cannot disqualify particular persons. It is recommended that the employer should consult with any seafarers' organisation representing his employees when making these rules. The master should organise the election of a safety representative within 3 days of being requested to do so by any two persons entitled to vote.

3.5.3 The number of safety representatives who should be elected will vary according to the size of a crew. The following ratios are recommended:

5 – 9 crew	1 Safety Representative
10 – 19 crew	2 Safety Representatives
20 – 49 crew	3 Safety Representatives
For every additional 50 crew	1 Additional Safety Representative

3.5.4 The master must record the election or appointment of every safety representative in writing – this should be either in the official logbook or in the minutes of safety committee meetings (see below).

3.5.5 When there is a substantial change in those working on board, the master should remind personnel of their right to elect new safety representatives.

3.6 Safety Committees

3.6.1 Once safety representatives have been elected, the Company must appoint a safety committee. The committee must be chaired by the master, and members will include, as a minimum, the safety officer and all elected safety representatives. If practical, any competent person appointed by employers other than the Company, should be invited to attend.

3.6.2 It is desirable that there should be a safety committee on every ship with more than five workers but it is an obligation to have a safety committee on all ships with more than ten (10) workers.

3.6.3 The master must record the appointment of a safety committee in writing – this should normally be in the official logbook or minutes of the committee's meetings.

3.6.4 The composition of a safety committee recommended above does not preclude the appointment of other temporary members. However, the committee should be kept compact enough to maintain the interest of members and enable it to function efficiently. Where possible, the relevant shore managers with responsibility for safety on board may attend safety committee meetings on board ship and should in any event see the committee's minutes. On short-haul ferries on which different crews work a shift system a scheme of alternate committee members may be adopted to secure proper representation.

3.6.5 Where large numbers of personnel work in separate departments (e.g. passenger ship galleys and restaurants), departmental sub-committees should be formed on lines similar to those of the main committee and under the chairmanship of a senior member of the department who should serve as a member of the main safety committee in order to report the views of the sub-committee.

3.6.6 It is preferable to appoint as secretary someone other than a safety official, as officials need to concentrate on the discussion rather than on recording it.

3.7 Termination of Appointments

3.7.1 A **safety officer'**s appointment terminates as soon as he ceases to be employed in the particular ship or the employer terminates the particular appointment.

3.7.2 A **safety representative** cannot have his appointment terminated by the employer or master. He can resign or the crew can elect another in his place. Otherwise he remains a safety representative for as long as he serves on the ship but no more than three (3) years. After the third year new elections for safety representatives must be organised.

3.7.3 A **safety committee** may be disbanded only when there is no longer an elected safety representative on board. A safety committee can, however, operate whether or not there is an elected safety representative.

3.8 Support for Safety Officials

3.8.1 The company and master have a duty to facilitate the work of any person appointed as a safety official, providing them with access to a copy of this Code and any relevant legislation, merchant shipping notices and other information including:

(a) findings of the risk assessment and measures for protection in place;

(b) any other factors affecting the health and safety of those working on the ship;

(c) details of fire-fighting, first aid and other emergency procedures.

3.8.2 Relevant information might include that concerning dangerous cargoes, maintenance work, the hazards of machinery, plant, equipment, processes and substances in use, and appropriate precautions. This will require co-ordination with all employers to obtain information about the findings of their risk assessment.

3.8.3 The Company and master, in co-operation with the employer, must also ensure that safety officials have the necessary resources and means, and allow them sufficient time off from their duties without loss of pay, to enable them to fulfil their functions or undertake any necessary health and safety training. This will include providing any necessary accommodation and office supplies.

3.8.4 Some training may be arranged on board, but to fulfil their function as shipboard safety adviser properly, safety officers should undertake a proper training course for the appointment.

3.8.5 On a ship where no safety officer is appointed, the Company must ensure that a record is kept of all incidents resulting in death, major or serious injury and every dangerous occurrence. This record must be available on request to any elected representative, and any person duly authorised by the Department of Merchant Shipping.

3.8.6 Employers must enable workers or their elected representatives to make representations about health and safety, and should also accept representations or recommendations from the safety officer. The Company and master will also receive representations, safety officers and safety committees. These should be carefully considered and any agreed measures should be implemented as soon as reasonably practicable.

3.8.7 The reaction to such representations will be seen as a measure of commitment to health and safety on board. All representations received, from whichever source, should be considered carefully. If there is likely to be a delay in giving an answer, then whoever has made the representations should be informed as soon as possible. Safety suggestions should be implemented, when it is feasible and reasonable to do so, as soon as reasonably practicable. If suggestions for health and safety measures are rejected, reasons should be given in writing. It is good practice to acknowledge all suggestions put forward, whether or not a written response is needed.

3.8.8 It is most important that the master takes a close interest in the work of the safety officials on board. He should check that the safety officer is fulfilling his duties

effectively, but should also give encouragement and support. The master is in much the best position to ensure that the committee works successfully, by encouraging participation and co-operation from all members.

3.8.9 The accidents and incidents which must be reported to the Department of Merchant Shipping are set out in paragraph 3.14.2. It may sometimes be appropriate for companies to inform other ships in the fleet of an incident, and give appropriate recommendations on action to be taken, in accordance with the Company's safety management system.

Duties of Safety Officers

3.9 General advice to safety officers

3.9.1 It is very important that the safety officer maintains a good working relationship with safety representatives – for example, inviting the relevant safety representatives to join him for the regular inspection of each part of the ship, or while carrying out an investigation, consulting them on safety matters and arrangements, and in particular on any follow-up action proposed.

3.9.2 The safety officer's relationship with the safety committee is rather different since he is both a member of the committee and also to some extent subject to its direction. A committee has the right to inspect any of the records which a safety officer is required by law to keep, and has the power to require the safety officer to carry out any health or safety inspections considered necessary.

3.10 Advice on compliance with safety requirements

3.10.1 The safety officer is required to try to ensure compliance with the provisions of the Legislation and this Code and any health and safety guidance and instructions or the ship.

3.10.2 The safety officer's role should be a positive one, seeking to initiate or develop safety measures before an incident occurs rather than afterwards. He should:

be on the lookout for any potential hazards and the means of preventing incidents;

try to develop and sustain a high level of safety consciousness among the crew so that individuals work and react instinctively in a safe manner and have full regard to the safety not only of themselves but also of others. The objective is to become the ship's adviser on safety to whom the master, officers and all personnel will naturally turn for advice or help on safe working procedures;

where unsafe practice is observed, approach the individual or responsible officer concerned to suggest improvements in his method of working or use the safety committee to discuss examples of dangerous or unsafe practices in a particular area. If this brings no improvement, the safety officer should consider approaching the head of departments or, as a last resort, the master to use his influence;

ensure that each worker joining the ship is instructed in all relevant health and safety arrangements, and of the importance attached to them before starting work. A suggested outline for this induction is given in Chapter 8.

where possible, ensure that arrangements are made for each new entrant to work with a crew member who is himself thoroughly safety conscious;

remind experienced seamen joining the ship for the first time of the importance of a high level of safety consciousness and of setting a good example to less experienced personnel.

3.10.3 The Safety Officer should also promote safety on board, subject to the agreement of the master, by:

(a) arranging the distribution of booklets, leaflets and other advisory material on safety matters

(b) supervising the display of posters and notices, replacing and renewing them regularly;

(c) arranging for the showing of films of safety publicity and, where appropriate, organise subsequent discussions on the subjects depicted;

(d) encouraging members of the crew to submit ideas and suggestions for improving safety and enlist their support for any proposed safety measures which may affect them (the person making a suggestion should always be informed of decisions reached and any action taken);

(e) effective communication of new requirements or advice in relevant shipping legislation, DMS Circulars and Company and ship's rules and instructions relating to safety at work about the ship.

Investigation of accidents and dangerous occurrences

3.10.4 The safety officer has a duty to investigate notifiable accidents or dangerous occurrences affecting persons on board ship or during access, as well as potential hazards to health and safety and any reasonable complaints made by any personnel, and to make recommendations to the master. It is good practice to record and investigate as appropriate all incidents, reported by personnel or passengers.

3.10.5 Additional health or safety investigations or inspections may be commissioned by the safety committee.

Safety Inspections

3.10.6 The safety officer must carry out health and safety inspections of each accessible part of the ship at least once every three months, or more frequently if there have been substantial changes in the conditions of work.

3.10.7 “Accessible” should be taken as meaning all those parts of the ship to which any member of the crew has access without prior authority.

3.10.8 Deciding whether “substantial changes in the conditions of work” have taken place is a matter of judgment. Changes are not limited to physical matters such as new machinery but can also include changes in working practices or the presence of possible new hazards. A record should be kept of all inspections.

3.10.9 It is not necessary to complete an inspection of the whole of the ship at one time, as long as each accessible part of the ship is inspected every 3 months. It may be easier to get quick and effective action on recommendations arising out of an inspection, if one section is dealt with at a time. When inspecting a section the safety officer should be accompanied by the officer or petty officer responsible for it.

3.10.10 Before beginning any inspection, previous reports of inspections of the particular section should be read, together with the recommendations made and the subsequent action taken. The control measures identified in any relevant risk assessment should also be read, and compliance with them checked during the inspection. Any recurring problems should be noted and, in particular, recommendations for action which have not been put in place. It is important, however, not to allow the findings of previous inspections to prejudice any new recommendations.

3.10.11 It is not possible to give a definitive check list of everything to look for but safe access, the environment and working conditions are major items. Suggestions for consideration on these particular issues are given in Annex 3.1.

3.10.12 The safety officer is required to make representations and, where appropriate, recommendations to the master and through him to the Company about any deficiency in the ship in respect of statutory requirements relating to health and safety, relevant DMS Circulars and the provisions of this Code.

3.10.13 In order to fulfil this function properly, the safety officer needs to be conversant with any appropriate legislation. The introduction of new legislation or of amendments to existing legislation is announced in Circulars issued by the Department of Merchant Shipping.

Record of accidents and dangerous occurrences

3.10.14 The safety officer must maintain a record of all accidents and dangerous occurrences (see 3.14.10-11). On a ship where no safety officer is appointed, this duty falls to the Company. These records must be made available on request to any safety representative, the master or to any person duly authorised by the Department of Merchant Shipping.

Duty to stop dangerous work

3.10.15 The safety officer has a duty to stop any work which he reasonably believes may cause a serious accident and immediately to inform the master (or his deputy) who is responsible for deciding when work can safely be resumed.

3.10.16 This does not apply to an emergency action to safeguard life even though that action itself may involve a risk to life. The safety officer is not required to take any of the actions described in 3.10.1, 3.10.4, 3.10.5, 3.10.6, 3.10.11, 3.10.14 and 3.10.15 at a time when emergency action to safeguard life or the ship is being taken.

3.11 Powers of Safety Representatives

3.11.1 Unlike the safety officer, the safety representative has powers not duties, although membership of the safety committee imposes certain obligations.

3.11.2 Safety representatives may, with the agreement of the safety officer, participate in investigations and inspections carried out by the safety officer, or, after notifying the master or his deputy, may carry out their own investigation or inspection.

3.11.3 They may also make representations to the employer on potential hazards and dangerous occurrences, and to the master or employer on general health and safety matters, including the appointment of a competent person (see chapter 16.3), the findings of the risk assessment, health and safety training, and the introduction of new technology.

3.11.4 They may request, through the safety committee, that the Safety Officer undertakes an investigation and reports back to them, and may inspect any of the records the Safety Officer is required to keep. They should ensure that they see all incident reports submitted to the DMS

3.12 Advice to Safety Representatives

3.12.1 The effectiveness of safety representatives will depend to a large extent on good co-operation between them, the Company, other employers, the master, heads of department and safety officer.

3.12.2 Safety representatives should:

put forward their views and recommendations in a firm but reasonable and helpful manner;

be sure of the facts;

be aware of the legal position;

be conscious of what is reasonably practicable.

3.12.3 Having made recommendations, they should request to be kept informed of any follow-up action taken, or the reason why such action was not possible.

3.12.4 If a safety representative finds that his efforts are being obstructed, or he is denied facilities, he should bring the matter to the attention of the safety officer or of the master through the safety committee. It should be the aim to settle any difficulties on board ship or through the employer. If this proves impossible the problem should be referred to the trade union or to the Department of Merchant Shipping.

3.13 Advice to Safety Committees

3.13.1 The safety committee is a forum for consultation between the master, safety officials and others of matters relating to health and safety. It may be used by employers for consultation with the company and employees. Its effectiveness will depend on the commitment of its members, in particular that of the master. Because of its broad membership, and with the master as its chairman, the committee has the means to take effective action in all matters which it discusses other than those requiring the authorization of the Company and employer.

3.13.2 The frequency of meetings will be determined by circumstances but as a general guideline, the committee should meet about every 4-6 weeks.

3.13.3 An agenda (together with any associated documents and papers, and the minutes of the previous meeting) should be circulated to all committee members in sufficient time to enable them to digest the contents and to prepare for the meeting.

3.13.4 If there is a particularly long agenda, it may be better to hold two meetings in fairly quick succession rather than one long one. If two meetings are held, priority at the first meeting should, of course, be given to the more urgent matters.

3.13.5 The first item on the agenda should always be the minutes of the previous meeting. This allows any correction to the minutes to be recorded and gives the opportunity to report any follow-up action taken.

3.13.6 The last item but one should be “any other business”. This enables last minute items to be introduced, and prevents the written agenda being a stop on discussion.

3.13.7 The last item on the agenda should be the date, time and place of the next meeting.

3.13.8 Minutes of each meeting should record concisely the business discussed and conclusions reached. A copy should be provided to each committee member. Normally, they should be agreed as true record at the next meeting, or amended if necessary, under the first item of the agenda (see 3.13.5).

3.13.9 A minutes file or book should be maintained, together with summary of recommendations recording conclusions reached, in order to provide a permanent source of reference and so ensuring continuity should there be changes in personnel serving on the committee.

3.13.10 All personnel should be kept informed on matters of interest which have been discussed, for example by posting summaries or extracts from the minutes on the ship’s notice boards. Suggestions may be stimulated by similarly posting the agenda in advance of meetings.

3.13.11 Relevant extracts of agreed minutes should be forwarded through the master to the Company and, where appropriate, individual employers, even when the matters referred to have already been taken up with them.

3.14 Accident Investigation

3.14.1 The investigation of accidents and incidents plays a very important part in safety. It is by the identification and study of accidents that similar events may be prevented in future, and that possible amendments to safety regulations can be identified.

3.14.2 The accidents and incidents that must be reported to Department of Merchant Shipping are as per Circular No. 19-2005.

3.14.3 The master is responsible for the reporting of accidents and dangerous occurrences. Where a safety officer is onboard, however, it is his statutory duty to investigate every such incident and it is expected that the master will rely extensively on the results and record of the safety officer's investigation when completing his report. The various stages of the investigation might proceed as follows:

(a) When an incident occurs priority must be given to the safety of the injured and of those assisting them, and to the immediate safety of the area. When sufficient help is available, however, the safety officer should, if possible, avoid involvement with the rescue operation and concentrate on establishing the immediate facts concerning the incident;

(b) First he should record the names – and addresses in case of non-crew personnel – all of those present in the vicinity of the incident. Not all are likely to be witnesses to the actual incident but this can be ascertained later. He should then note and mark the position of the injured, and the use and condition of any protective clothing or equipment or of any tools etc. likely to have been in use. Possession should be taken of any portable items which might have some relevance to the investigation. Sketches and photographs are often useful;

(c) When the injured have been removed, the safety officer should carry out a more detailed examination at the scene of the incident, watching out for any changes which might have occurred since the incident and any remaining hazards.

3.14.4 The points to look out for will depend on the circumstances. For example after an incident during boarding, the following should be noted:

compliance with control measures identified by the risk assessment;

the type of access equipment in use;

the origin of the access equipment, e.g. ship's own, provided from shore etc.;

the condition of the access equipment itself, noting particularly any damage such as a broken guard-rail or rung. The position and extent of any damage should be examined so that it may be compared with witnesses' statements, and it should be noted

whether the damage was present before, or occurred during or as a result of the incident (if the damage was present before the incident it might have been potentially dangerous but it may not necessarily have been a factor in the particular incident);

any effect of external factors on the condition of the equipment, e.g. ice, water or oil on the surface;

the deployment of the equipment, i.e. the location of the quayside and shipboard ends of the equipment;

the rigging of the equipment, the method of securing, the approximate angle of inclination;

the use of ancillary equipment (safety net, lifebuoy and lifeline, lighting);

the safety of shipboard and quayside approaches to the equipment, e.g. adequate guard-rails, obstructions and obstacles etc.;

any indication of how the incident might have happened, but remember that subsequent interviews with witnesses must be approached with an open mind;

weather conditions;

distances where these are likely to be helpful or relevant.

3.14.5 Interviews of witnesses should take place as soon as possible after the incident when memories are still fresh. There may be people who were not actually witnesses but who may nevertheless have valuable contributions to make, for example a crewman who was present when an order was given. There persons should not be overlooked. If it is not possible for some reason to interview a particular person, he should be asked to send the safety officer his own account of the incident.

3.14.6 The actual interview should be carried out in an informal atmosphere designed to put the witness at his ease. To start with, the safety officer should explain the purpose of the interview and obtain some details of the witness's background. It is important to keep any personal bias out of the interview. The witness should be asked to relate the event in his own way with as few interruptions as possible. The accuracy of what is said should be tested. There may, for example, be discrepancies between the account of one witness and those of other witnesses, between different parts of a statement, or with the safety officer's own observations, which he may want to query. Leading questions implying an answer should be avoided, as should simple questions requiring only a yes/no answer which save the witness from thinking about what he is saying. Finally, the safety officer should go over the statement with the witness to ensure that it has been accurately recorded.

3.14.7 Statements for signature by the witness should be prepared as quickly as possible but, if the witness changes his mind about signing a statement, it should be annotated by the safety officer that it has been prepared on the basis of an interview with the witness who had subsequently refused to sign it or comment further. Where the witness asks for extensive alterations to the original statement fresh statement may have to be prepared, but the original statement should be annotated by the safety officer and retained. Also the

investigator must ask the witness if he agrees that his statement may be released to third parties.

3.14.8 It is helpful to adopt a standard format for statements by incident witnesses. A suggested format is at Annex 3.2.

3.14.9 It is worth emphasising the importance of distinguishing between facts and opinions. Facts can normally be supported by evidence whereas opinions are personal beliefs. An investigation must depend on the facts gathered but opinions can be helpful in pursuing a particular line of enquiry and should not be disregarded.

3.14.10 Any record of incidents and dangerous occurrences (see 3.10.14 above) should contain at least the following information:

details of incidents/dangerous occurrences/investigations/complaints/inspections;

date;

persons involved;

nature of injuries suffered;

all statements made by witness;

any recommendations/representations;

any action taken.

3.14.11 Additionally it is suggested that it should contain the following:

list of witnesses, addresses, positions and occupations;

where abouts of original signed statement made by witnesses;

date accident/dangerous occurrence reports sent to DMS if applicable;

list of items collected, why and where stored;

index.

3.14.12 The record should be kept with the ship since it must be made available on request to the safety representative and safety committee, if any. It is also a necessary item of reference for safety officers on board the ship. If the ship is sold and remains on the Cyprus register, the record should be transferred with the ship. Where the ship becomes a foreign ship the record should be retained by the original owners.

ANNEX 3.1

CHECK LIST FOR SAFETY OFFICER'S INSPECTION

The following are examples of questions the safety officer should consider. This is not intended to be an exhaustive list, and should be varied according to the particular design or conditions on a particular ship.

MEANS OF ACCESS/SAFE MOVEMENT

Are means of access, if any, to the area under inspection (particularly ladders and stairs), in a safe condition, well lit and unobstructed?

If any means of access is in a dangerous condition, for instance when a ladder has been removed, is the danger suitably blocked off and warning notices posted?

Is access through the area of inspection both for transit and working purposes clearly marked, well lit, unobstructed and safe?

Are fixtures and fittings over which seamen might trip or which project, particularly overhead, thereby causing potential hazards, suitably painted or marked?

Is any gear, which has to be stowed within the area, suitably secured?

Are all guard-rails in place, secure and in good condition?

Are all openings through which a person could fall, suitably fenced?

If portable ladders are in use, are they properly secured and at a safe angle?

WORKING ENVIRONMENT

Is the area safe to enter?

Are lighting levels adequate?

Is the area clear of rubbish, combustible material, spilled oil etc.?

Is ventilation adequate?

Are members of the crew adequately protected from exposure to noise where necessary?

Are dangerous goods and substances left unnecessarily in the area or stored in a dangerous manner?

Are loose tools, stores and similar items left lying around unnecessarily?

WORKING CONDITIONS

Is machinery adequately guarded where necessary?

Are any necessary safe operating instructions clearly displayed?

Are any necessary safety signs clearly displayed?

Are permits-to-work used when necessary?

Are crew working in the area wearing any necessary protective clothing and equipment?

Is the protective clothing and equipment in good condition and being correctly used?

Is there any evidence of defective plant or equipment and if so what is being done about it?

Is the level of supervision adequate, particularly for inexperienced crew?

What practicable safety improvements could be made?

GENERAL

Are all statutory regulations and company safety procedures being complied with?

Is the safety advice in publications such as this Code, Shipping Notices etc. being

followed where possible?

Have the crew in the area any safety suggestions to make?

Have any faults identified in previous inspections been rectified?

ANNEX 3.2

VOLUNTARY STATEMENT

Relating to an accident on board/Name of ship/official number ……

On/date of accident/at/time of accident.

Particulars of witness:

Name:

Rank and occupation:

Home address of crew members:

Address of employment of others:

_____

STATEMENT OF WITNESS

I make this statement voluntarily having read it before signing it and believing the same to be true.

Signature of Witness

Date Time

_____

Particulars of Interviewer

Name:

Rank:

Chapter 4 - Personal Protective Equipment

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

4.1 Introduction

4.1.1 Risks to the health and safety of workers must be identified and assessed. It will often not be possible to remove all risks, but attention should be given to control measures which make the working environment and working methods safe.

4.1.2 Personal protective equipment must be used only when risks cannot be avoided or reduced to an acceptable level by safe working practices, that cause no health risk to any worker. This is because personal protective equipment does nothing to reduce the hazard, and can only protect the person wearing it, leaving others vulnerable. See Chapter 1 Annex 1.1 paragraph 5.4 on the hierarchy of control measures.

4.1.3 It should be noted that the use of personal protective equipment may in itself cause a hazard – for example, through reduced field of vision, loss of dexterity or agility.

4.2 Employer duties

4.2.1 It is the responsibility of the employer to ensure that workers are provided with suitable personal protective equipment where it is needed.

4.2.2 As a general rule, personal protective equipment should be supplied at no cost to the worker. The exception to this is where it is not exclusive to the workplace and so workers may be required to contribute to the cost or when workers wish to have equipment which exceeds the minimum standards required (e.g. a more attractive design).

4.2.3 Employers should assess the equipment required to ensure that it is suitable and effective for the task in question, and meets the appropriate standards of design and manufacture.

4.2.4 Suitable equipment should:

(a) Be appropriate for the risks involved, and the task being performed, without itself leading to any significant increased risk;

(b) fit the worker correctly after any necessary adjustment;

(c) take account of ergonomic requirements and the worker's state of health;

(d) be compatible with any other equipment the worker has to use at the same time, so that it continues to be effective against the risk.

4.2.5 The appropriate personal protective equipment of the required standard (see appendix 1) must be supplied to the workers, wherever risk assessment indicates that there is a risk to health and safety from a work process which cannot be adequately controlled by other means, but which can be alleviated by the provision of such clothing or equipment.

4.2.6 The employer is also required to ensure that personal protective equipment is regularly checked and maintained or serviced. Records should be maintained of servicing and any repair required and carried out.

4.2.7 All workers who may be required to use protective equipment must be properly trained in its use. This should include being advised of its limitations. A record should be kept of who has received training.

4.2.8 Defective or ineffective protective equipment provides no defense. It is therefore essential that the correct items of equipment are selected and that they are properly maintained at all times. The manufacturer's instructions should be kept safe with the relevant apparatus and if necessary referred to before use and when maintenance is carried out. Personal protective equipment should be kept clean and should be disinfected as and when necessary for health reasons.

4.2.9 A competent person should inspect each item of protective equipment at regular intervals and in all cases before and after use. All inspections should be recorded. Equipment should always be properly stowed in a safe place after use.

4.3 Worker duties

4.3.1 Workers must wear the protective equipment or clothing supplied when they are carrying out a task for which it is provided, and follow appropriate instructions for use.

4.3.1 Personal protective equipment should always be checked by the wearer each time before use. Workers should comply with the training they have received in the use of protective items, and follow the manufacturer's instructions for use.

4.4 Types of equipment

4.4.1 Overalls, gloves and suitable footwear (see 4.2.5) are the proper working dress for most work about ship but these may not give adequate protection against particular hazards in particular jobs. Specific recommendations for the use of special personal

protective equipment will also be found in relevant Chapters in Section 3 of the Code but there will be other occasions when the need for such special protection will be identified by the risk assessment carried out by the officer in charge at that particular time. Personal protective equipment must always be selected according to the hazard being faced and the kind of work being undertaken, in accordance with the findings of the risk assessment.

4.4.2 Personal equipment can be classified as follows:

Type	Examples
Head protection	Safety helmets, bump caps, hair protection
Hearing protection	Ear muffs, ear plugs
Face and eye protection	Goggles and spectacles, facial shields
Respiratory protective equipment	Dust masks, respirators, breathing apparatus
Hand and foot protection	Gloves, safety boots and shoes
Body protection	Safety suits, safety belts, harnesses, aprons, high visibility clothing
Protection against drowning	Lifejackets, buoyancy aids and lifebuoys
Protection against hypothermia	Immersion suits and Thermal aids

4.5 Head Protection

Safety Helmets

4.5.1 Safety helmets are most commonly provided as a protection against falling objects. They can also protect against crushing or a sideways blow, and chemical splashes.

4.5.2 Since the hazards may vary, it will be appreciated that no one type of helmet would be ideal as protection in every case. Design details are normally decided by the manufacturer whose primary consideration will be compliance with an appropriate standard (see 4.2.5). The standard selected should reflect the findings of the risk assessment.

4.5.3 The shell of a helmet should be of one piece seamless construction designed to resist impact. The harness or suspension when properly adjusted forms a cradle for supporting the protector on the wearer's head. The crown straps help absorb the force of impact. They are designed to permit a clearance of approximately 25mm between the shell and the skull of the wearer. The harness or suspension should be properly adjusted before a helmet is worn. Safety equipment should be used in accordance with manufacturers' instructions.

Bump caps

4.5.4 A bump cap is simply an ordinary cap with a hard penetration-resistant shell (see 4.2.5). They are useful as protection against bruising and abrasion when working in confined spaces such as a main engine crankcase or a double bottom tank. They do not, however, provide the same protection as safety helmets and are intended only to protect against minor knocks.

Hair nets and safety caps

4.5.5 Personnel working on or near to moving machinery have always to be on their guard against the possibility of their hair becoming entangled in the machinery. Long hair should always be covered by a hair net or safety cap when working with or near moving machinery.

4.6 Hearing protection

4.6.1 All persons exposed to high levels of noise, e.g. in machinery spaces, should wear ear protection of a type recommended as suitable for the particular circumstances (see 4.2.5). Protectors are of three types – ear plugs, disposable or permanent, and ear muffs. For further information see Noise Levels on Board of Ships , published by the International Maritime Organization (1982).

4.6.2 The simplest form of ear protection is the ear plug. This type however has the disadvantage of limited capability of noise level reduction. Ear plugs of rubber or plastic have only limited effect, in that extremes of high or low frequency cause the plug to vibrate in the ear canal causing a consequential loss in protection. It may be difficult to keep re-usable ear plugs clean on a ship, and disposable ear plugs are recommended. Ear plugs should never be used by anyone with ear-trouble without medical advice.

4.6.3 In general, ear muffs provide a more effective form of hearing protection. They consist of a pair of rigid cups designed to completely envelope the ears, fitted with soft sealing rings to fit closely against the head around the ears. The ear cups are connected by a spring loaded headband (or neck band) which ensures that the sound seals around the ears are maintained. Different types are available and provision should be made according to the circumstances of use and expert advice.

4.7 Face and eye protection

4.7.1 The main causes of eye injury are:

(a) Infra-red rays – gas welding;

(b) ultra-violet rays – electric welding;

(c) exposure to chemicals;

(d) exposure to particles and foreign bodies.

Protectors are available in a wide variety, designed to international standard specifications, to protect against these different types of hazard (see 4.2.5).

4.7.2 Ordinary prescription (corrective) spectacles, unless manufactured to a safety standard, do not afford protection. Certain box-type goggles are designed so that they can be worn over ordinary spectacles.

4.8 Respiratory protective equipment

4.8.1 Respiratory protective equipment is essential for protection when work has to be done in conditions of irritating, dangerous or poisonous dust, fumes or gases. There are two main types of equipment which perform different functions.

(a) A respirator filters the air before it is inhaled;

(b) breathing apparatus supplies air or oxygen from an uncontaminated source.

4.8.2 Advice on selection, use and maintenance of the equipment is contained in CYS EN 12021:1999 standard (see Appendix 1).This should be available to all those concerned with the use of respiratory protective equipment on board ship (see 4.2.5).

4.8.3 It is most important that the face-piece of respirators and breathing apparatus is fitted correctly to avoid leakage. The wearing of spectacles, unless adequately designed for that purpose, or of beards is likely to adversely affect the face seat. This is a particularly important consideration in emergency situations.

Respirators

4.8.4 The respirator selected must be of a type designed to protect against the hazards being met.

(a) The dust respirator gives protection against dusts and aerosol sprays but not against gases. There are many types of dust respirator available but they are generally of the ori-nasal type, i.e. half-masks covering nose and mouth. Many types of light, simple face masks are also available and are extremely useful for protecting against dust nuisance and non-toxic sprays but should never be used in place or proper protection against harmful dusts or sprays.

(b) The positive pressure powered dust respirator incorporates a battery-powered blower unit, connected by a tube to the face-mask to create a positive pressure in the face-piece. This makes breathing easier and reduces face-seal leakage.

(c) The cartridge-type respirator consists of a full face-piece or half mask connected to a replaceable cartridge containing absorbent or absorbent material and a particulate filter. It is designed to provide protection against low concentrations of certain relatively non-toxic gases and vapours.

(d) The canister-type respirator incorporates a full face-piece connected to an absorbent or absorbent material contained in a replaceable canister carried in a sling on the back or side of the wearer. This type gives considerably more protection than the cartridge type.

4.8.5 The filters, canisters and cartridges incorporated in respirators are designed to provide protection against certain specified dusts or gases. Different types are available to provide protection against different hazards and it is therefore important that the

appropriate type is selected for the particular circumstances or conditions being encountered. It must be remembered, however, that they have a limited effective life and must be replaced or renewed at intervals in accordance with manufacturer's instructions.

4.8.6 RESPIRATORS PROVIDE NO PROTECTION AGAINST OXYGEN DEFICIENT ATMOSPHERE. They should never be used to provide protection in confined spaces such as tanks, cofferdams, double bottoms or other similar spaces against dangerous fumes, gases or vapours. Only breathing apparatus (self-contained or airline) is capable of giving protection in such circumstances.

Breathing apparatus

4.8.7 The type of breathing apparatus to be used when entering a space that is known to be, or suspected of being deficient in oxygen or containing toxic gas or vapours is given in section 16.13.

4.8.8 Breathing apparatus should not be used underwater unless the equipment is suitable for the purpose, and then only in an emergency.

Resuscitators

4.8.9 It is recommended that resuscitators of an appropriate kind should be provided when any person may be required to enter a dangerous space; see Chapter 16.

4.9 Hand and foot protection

Gloves

4.9.1 The exact type of glove selected will depend on the kind of work being undertaken or the particular substance being handled, and in these cases expert advice should be followed (see 4.2.5). The following are general rules:

(a) Leather gloves should be used when handling rough or sharp objects;

(b) Heat-resistant gloves should be used when handling hot objects;

(c) Rubber, synthetic or PVC gloves are generally best for handling acids, alkalis, various types of oils, solvents and chemicals in general.

Footwear

4.9.2 Foot injuries most often result from the wearing of unsuitable footwear (e.g. sandals, plimsolls and flip-flops) rather than from failure to wear safety shoes and boots (see 4.2.5). It is nevertheless strongly advisable that all personnel whilst at work on board ship wear appropriate safety footwear.

4.9.3 Injuries are commonly caused by impact, penetration through the sole, slipping, heat and crushing. Safety footwear is available which is designed to protect against these or other specific hazards identified in the risk assessment, manufactured to various standards appropriate to the particular danger involved.

4.10 Protection from falls

4.10.1 All personnel who are working aloft, outboard or below decks or in any other area where there is a risk of falling more than two metres, should wear a safety harness (or belt with shock absorber) attached to a lifeline (see 4.2.5). If a vessel is shipping frequent seas, nobody should be required to work on deck unless absolutely necessary. However, where this is unavoidable, persons on deck should wear a harness and, where practicable, should be secured by lifeline as a protection from falls and from being washed overboard or against the ship's structure.

4.10.2 Inertial clamp devices allow more freedom in movement.

4.11 Body protection

4.11.1 Special outer clothing may be needed for protection when personnel are exposed to particular contaminating or corrosive substances. This clothing should be kept for the particular purpose and dealt with as directed in the relevant section of the Code.

4.11.2 High visibility clothing (see 4.2.5) should be worn when it is important to be seen to be safe – for example, during loading and unloading operations.

4.11 Protection against drowning

4.11.1 Where work is being carried out over side or in an exposed position where there is a reasonable foreseeable risk of falling or being washed overboard or where work is being carried out in or from a ship's boat a lifebuoy with sufficient line should be provided. In addition and as appropriate a lifejacket or buoyancy aid should be provided. Where necessary, personnel should be provided with thermal protective clothing to reduce the risks of cold shock.

Chapter 5 - Safety Signs

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter, except paragraph 5.2.2, applies to such ships

5.1 Safety Signs

5.1.1 Any safety signs permanently erected on board the ship for the purpose of giving health and safety information or instruction must comply with ISO 3864:1984 (see appendix 1).

5.1.2 Safety signs, which include hazard warnings, should be used whenever a hazard or obstruction exists and such a sign is appropriate. Particular attention should be paid on passenger ships to hazards which may be familiar to seafarers but not to passengers.

5.1.3 Where a language other than English is extensively used on a ship, any text used in conjunction with a sign should usually be displayed also in that language.

5.2 General

5.2.1 Colours and symbols, when used appropriately, can provide information and warnings of hazards which can be understood by anyone, regardless of what language they speak. Chapter 27 gives types of sign which generally conform with both IMO standards, where they exist, and European wide standards.

5.2.2 Symbols relating to life saving appliances and fire control plans are governed by IMO standards. Information on these is given in the DMS Circular 19/1999 dated 8 July 1999 'Fire Control and Life Saving Appliances Plans'.

5.3 Role of the Employer

5.3.1 Employers should ensure that safety signs are displayed where appropriate. If the employer is not in a position to provide signs – for example, where the fittings of the ship are not within his control – he should ensure that signs are in place before allowing workers to start any relevant work.

5.3.2 The employer should also ensure that the system of signs in use is clearly understood.

5.4 Workers' responsibilities

5.4.1 All workers should ensure that they understand the meaning of signs and any colour coding system in use on their ship and follow the relevant safety procedures.

5.4.2 Those aware of any deficiency in their colour vision should tell their supervisor or employer, and take extra care where colour is used as a means of identification

Chapter 6 - Means of Access and Safe Movement

Application to fishing vessels which operate outside territorial waters
This Chapter, except for paragraph 6.3, applies to such ships
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

6.1 Means of Access

6.1.1 The master of a ship and the employer of the master are both obliged to ensure that a safe means of access is provided and maintained, both between the ship and the shore or another ship alongside which the ship is secured. In carrying out these duties full account must be taken of the principles and the guidance in Chapter 17 of this Code.

6.1.2 Where the provision of equipment is necessary to ensure safe means of access it must be placed in position promptly, be properly rigged and deployed, safe to use and adjusted as necessary to maintain safe access.

6.1.3 When access equipment is provided from the shore it is still the responsibility of the master to ensure as far as it reasonably practicable that the equipment meets these requirements.

6.1.4 Any access equipment and immediate approaches to it must be adequately lit. For these areas a lighting level of at least 20 lux should be provided (measured at a height of 1 metre above the surface level) unless:

(a) A higher level is required by other legislation;

(b) provision of such levels of lighting would contravene other legislation s, e.g. the Collision Regulations.

Guidance on lighting is given in Chapter 17.

6.1.5 Any equipment used for the provisions of means of access and any safety net must be fit for purpose and properly maintained. Accommodation ladders and any portable or rope ladders used for access must comply with the standards in Annex 17.1 of the Code. All access equipment should be inspected by a competent person at appropriate intervals.

6.1.6 A portable ladder should be used for access to the ship where no safer access is reasonably practicable. A rope ladder should only be used between a ship with high freeboard and a ship with low freeboard or between a ship and a boat if no safer means of access is reasonably practicable.

6.1.7 A lifebuoy with a self-activating light and also a separate buoyant safety line attached to a quoit or some similar device must be provided ready for use at the point of access aboard the ship.

6.1.8 An adequate number of safety nets of a suitable size and strength are to be carried on the ship or otherwise be readily available. Where there is a risk of a person falling from the access equipment or from the quayside or ship's deck adjacent to the access equipment, a safety net shall be mounted where reasonably practicable. Guidance on the rigging of safety nets is in Chapter 17.

6.2 Use of Equipment

6.2.1 When suitable access equipment is provided from the ship or from the shore or form another ship, any person boarding or leaving the ship must use that equipment.

6.3 Access for Pilots

6.3.1 SOLAS V/23 requires provision of pilot ladders, accommodation ladders and hoists which comply with the construction and testing requirements laid out in the Convention. Guidance on these standards is included in Annex 17.1.

6.3.2 In addition, SOLAS requires the master to ensure that:

each pilot ladder, accommodation ladder, hoist and associated equipment is properly maintained and stowed, and regularly inspected to ensure that, so far as is reasonably practicable, each is safe to use;

each pilot ladder and hoist is used only for the embarkation and disembarkation of pilots and by officials and other persons while a ship is arriving at or leaving a port;

the rigging of the pilot ladder, accommodation ladder, hoist and associated equipment is supervised by a responsible officer who is in communication with the navigating bridge. This officer's duties will include arranging for the pilot to be escorted by a safe route to and from the bridge. Advice on safe rigging of such equipment is given in Chapter 17.

personnel engaged in rigging or operating any mechanical equipment are instructed in the safe procedures to be adopted and that the equipment is to be tested prior to each use.

6.3.4 A safety-line and harness, a lifebuoy with a self-igniting light, and a lifebuoy having a line should be kept at hand ready for use.

6.3.5 The pilot ladder or hoist overside and its controls, and also the position where the person embarks and disembarks on the ship should be adequately lit.

6.3.6 The owner and the master must ensure that there is on board a copy of the approved manufacturer's maintenance manual for the hoist, containing a maintenance log book. The hoist must be maintained in accordance with the maintenance manual, and a record kept by the responsible officer in the maintenance log book.

6.3.7 The master is required to ensure that the hoist is subject to regular test rigging and inspection. Such tests should be carried out by designated ship's personnel at regular intervals. All tests should be logged.

6.4 Safe Movement

6.4.1 The master of a ship and the employer of the master are both obliged to ensure that safe means of access is provided and maintained to any place on the ship to which a person may be expected to go. In carrying out these duties full account must be taken of the principles and the guidance in Chapter 12 of this Code.

6.4.2 Places on the ship where persons may be expected to be include accommodation areas as well as normal places of work. "Persons" in this context include passengers, dock-workers, and other visitors to the ship on business but exclude persons who have no right to be on the ship.

6.4.3 All deck surfaces used for transit about the ship and all passageways, walkways and stairs must be properly maintained and kept free from substances liable to cause a person to slip or fall.

6.4.4 Areas used for the loading and unloading of cargo or for other work processes or for transit should be adequately and appropriately lit.

6.4.5 For areas used for loading or unloading of cargo or for other work processes a lighting level of at least 20 lux should be provided and for transit areas a level of at least 8 lux should be provided (measured at a height of 1 metre above the surface level) unless:

(a) A higher level is required by other regulations, e.g. on Crew Accommodation; or,

(b) provision of such levels of lighting would contravene other regulations eg the Collision Regulations.

General rules for where these specific regulations do not apply are given in Chapter 12.

6.4.6 The employer and master are also responsible for ensuring that any permanent safety signs displayed on board ship comply with guidance given in Chapter 5.

6.4.7 Any opening, open hatchway or dangerous edge into, through or over which a person may fall shall be fitted with secure guards or fencing of adequate design and construction. Advice on guard-rails and safety fencing is given in Chapter 12. These requirements do not apply where the opening is a permanent access way, or where work is in progress which could not be carried out with the guards in place.

6.4.8 All ship's ladders must be of good construction and sound material, strong enough for the purpose for which they are used, free from patent defect and properly maintained.

6.4.9 Suitable hand-holds should be provided at the top and at any intermediate landing place of all fixed ladders.

6.4.10 The employer and master are obliged to ensure that ship's powered vehicles (which includes mobile lifting plant) are only driven by a competent person who is

authorized to do so and to ensure that they are used safely. Such vehicles must be properly maintained.

6.5 Entry into dangerous spaces

6.5.1 A dangerous space is defined as “any enclosed or confined space in which it is foreseeable that the atmosphere may at some stage contain toxic or flammable gases or vapours, or be deficient in oxygen, to the extent that it may endanger the life or health of any person entering that space.” Chapter 16.4 gives advice on identifying these hazards.

6.5.2 The master is required to ensure that all unattended dangerous spaces are secured against entry, except when it is necessary to enter.

6.5.3 Employers must have procedures in place for entering and working in confined spaces, and it is the master’s responsibility to ensure these are followed. No person should enter or remain in a dangerous space except in accordance with the set procedures.

6.5.4 The guidance in this Code (Chapter 16) must be taken into account both in drawing up and implementing the procedures.

Chapter 7- Work Equipment

7.1 Health and Safety at Work - General
7.2 Guarding of Machinery and Safety of Electrical Equipment
7.3 Hatches and Lifting Plant
7.4 Hatches
7.5 Lifting appliances

Application to fishing vessels which operate outside territorial waters

This chapter, except for paragraph 7.5, applies to such ships
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships, except that paragraph 7.5 does not apply to ships of less than 100gt

7.1 Health and Safety at Work – General

7.1.1 Employers have a duty to provide and maintain plant machinery and equipment which are safe and without risk to health.

7.1.2 The term "work equipment" applies to any machine, apparatus, tool or installation used at work, ranging from hand tools to the main engines. The exception to this is the safety equipment and apparatus provided in compliance with SOLAS requirements.

7.1.3 In practice, work equipment supplied by the ship is generally the responsibility of the Company.

7.1.4 Any equipment made available to workers should comply with any relevant standards and maintained in accordance with the manufacturers' instructions. Equipment not covered by specific regulations or type approvals should comply with the appropriate European Standard or its nearest international equivalent.

7.1.5 The employer is responsible for ensuring that workers are properly trained to use any equipment they need to do their job.

7.1.6 Instruction does not necessarily have to be a formal training course. All instruction or information must be in a language that those concerned understand and communicated effectively.

7.1.7 Any equipment made available to workers should be the appropriate and accordingly adjusted for the job undertaken.

7.2 Guarding of Machinery and Safety of Electrical Equipment

7.2.1 The employer and master must ensure that all machinery on board is safe and properly guarded.

7.2.2 Every dangerous part of the ship's machinery must be securely guarded, where that is necessary for the safety of anyone on board.

7.2.3 Exceptions are allowed for the purposes of examination, adjustment or any test that is shown to be immediately necessary. However, the following conditions must be in place:

exposure of the dangerous part must be the minimum necessary;

a responsible ship's officer or other responsible person must authorise the exposure;

only a competent person may carry out the examination;

any person working close to the machinery must have enough clear space and adequate lighting while they are working;

all the very hot or cold surfaces must be covered;

any person operating or close to the machinery must have adequate instruction in safe systems of work for that machinery, the dangers arising from its operation and the precautions to be taken; and

a conspicuous warning notice must be displayed on or close to the machinery.

7.2.4 Guards and other devices provided must be of substantial construction and properly maintained and, except as allowed above, kept in position when the relevant machinery parts are in motion.

7.2.5 There must be means for taking prompt action to stop any machinery and cut off power in the event of an emergency.

7.2.6 All ship's electrical equipment and installations must be constructed, installed, operated and maintained in such a way that there is no electrical hazard to the ship or any person.

7.3 Hatches and Lifting Plant

7.3.1 In carrying out their duties with respect to hatches and lifting plant, the employer and master must take full account of the principles and the guidance described in this Chapter and Chapters 20 (for lifting plant) and 25 (for hatches) of this Code.

7.4 Hatches

7.4.1 Any hatch covering must be of sound construction and material, fit for the purpose, free from patent defect and properly maintained.

7.4.2 The master must ensure that:

a hatch covering is only used if it can be removed and replaced without endangering personnel;

a hatch is not used unless the covering has been completely removed or properly secured;

only an authorised person operates a power-operated hatch covering, except in the event of an emergency.

7.5 Lifting appliances

7.5.1 The inspection and certification of lifting appliances is governed by the 'Inspection regulations for lifting appliances and elevators' set out in DMS Circular of 29 April 2002 (12/2002).

7.5.2 The regulations contain requirements as to the construction and operation of lifting appliances and elevators, and for their inspection and testing by surveyors of recognized organizations, and for the issue of certificates by recognized organizations. The shipowner and master must ensure the requirements of the regulations are fulfilled, and that lifting appliances and elevators have the certificates specified in the regulations, namely, as appropriate –

Certificate of lifting appliances and elevators of passenger ships

Inspection book of lifting appliances of cargo ships over 100 GT (Cargo gear book)

Certificate of lifting appliances(for non-cargo handling item) and elevators of cargo ships over 100 GT',

Section 2 - Personal Health and Safety

Chapter 8 - Safety Induction

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter, except for paragraph 8.1, applies to such ships

8.1 General

8.1.1 Under the relevant parts of the STCW Code attached to the International Convention on Standards of Training, Certification and Watchkeeping 1978 as amended in 1995 (STCW 95), as implemented by section 11 of the Merchant Shipping (Safe Manning, Hours of Work and Watchkeeping) Law of 2000 (Law 105(I)/2000), all new personnel joining a vessel (other than passengers) must undergo a safety induction. They must be given a reasonable opportunity to become familiar with the shipboard equipment, operating procedures and other arrangements needed for the proper performance of their duties, before being assigned to those duties.

8.1.2 This includes –

a. allocation of a reasonable period of time during which the newly employed seafarer will have an opportunity to get acquainted with -
   i. the specific equipment he will be using or operating; and
   ii. the ship's specific procedures and arrangements regarding watchkeeping, safety, environmental protection and emergency procedures, which he will need to know; and

b. assignment to a knowledgeable crewmember who will be responsible for ensuring that the newly employed seafarer will receive all esssential information which he must possess, in a language the seafarer understands.

8.1.3 It is recommended that each Company should design and implement a standard induction programme for each vessel, covering the STCW requirements, and incorporating any expanded detail specific to that vessel's particular needs.

8.1.4 On completion of the standard safety induction, it is also recommended that new personnel receive departmental induction covering safe working practices, areas of responsibility, departmental Standing Orders, and training/certification requirements to operate specific machinery or undertake specific tasks.

8.2 Emergency procedures and fire precautions

8.2.1 All new personnel should be given a clear explanation of the vessel's alarm signals, and be given instruction on the emergency assembly stations, lifeboat stations and fire drill/team requirements.

8.2.2 Smoking regulations on the vessel should be strictly observed. Safe and correct disposal of cigarette ends is essential, and "No Smoking" notices should be strictly obeyed.

8.2.3 Fire aboard a vessel can be disastrous. Common causes are:

faulty electrical appliances/circuitry;

overloading of electrical circuitry;

careless disposal of cigarette ends;

spontaneous combustion of dirty waste/rags especially if contaminated with oil;

damp storage of linen/materials;

oil spillage/leakage in machinery spaces;

galley fires due to overheating of cooking oils;

carelessness with hand pressing irons;

incorrect methods of drying laundry.

8.2.4 Personnel should be made aware of these risks and ensure at all times through good housekeeping, regular inspection and maintenance of electrical circuitry and appliances etc. that fire risks are removed where possible or kept to a minimum.

8.3 Accidents and Medical emergencies

8.3.1 All personnel should know the action to be taken in cases of accident or medical casualty on board ship. For example, at least they will need to know how to raise the alarm and seek assistance.

8.4 Health and hygiene

8.4.1 Sufficient and suitable sanitary conveniences shall be provided, maintained and kept clean. There shall be provided and maintained for the use of persons at work, adequate and suitable facilities for washing and cleaning corresponding to the nature of their work, conveniently accessible and shall be maintained and kept clean and in a proper condition. It is the responsibility of individuals to ensure high standards of personal hygiene and to look after their own health. Attention should be paid to:

personal cleanliness;

sensible diet;

adequate sleep during rest periods;

regular exercise;

avoidance of excess alcohol/tobacco;

prompt attention to cuts/abrasions;

maintenance of working clothes and protective equipment in a clean condition;

appropriate dress for the work and climate;

avoidance of recreational drugs.

8.4.2 On international voyages, any vaccinations/inoculations required should be fully updated. Medications for prevention of illness (e.g. anti-malarial tablets etc.) should be taken as and when required.

8.4.3 In hot climates, it is important to protect skin from strong sunlight and drink plenty of salt-containing liquids to replace the body fluids lost through perspiration.

8.5 Good Housekeeping

8.5.1 All ships move in a seaway and as space is very limited aboard any vessel, good housekeeping is essential for safe working/access and hygiene control. Attention should be paid in particular to the following areas:

Safe and secure stowage of loose items;

proper securing of doors etc.;

good maintenance of fittings and fixtures;

adequate illumination of all work/transit areas;

avoidance of overloading of electrical circuits especially in cabins;

clear and legible signs/operational notices;

proper clearance and disposal of garbage/waste materials.

8.6 Environmental Responsibilities

8.6.1 The maintenance of good standards to protect the environment, whether local (i.e. accommodation/work areas) or the wider environment is important and is the responsibility of all personnel. Many aspects are covered by international legislation and it is the duty of all personnel to ensure strict compliance with such legislation.

8.6.2 Handling and storage of garbage can present health and safety hazards to crews and ships. Requirements of the garbage management plan should be observed.

8.6.3 Particular attention should be paid to the correct methods of disposal of waste oils (bilge or other), chemicals, galley waste, garbage (especially plastics, glass, drums and other non-biodegradable items), redundant items (moorings, dunnage, cargo cleanings etc.). See Annex 8.1.

8.6.4 Incinerators and compactors should always be operated by competent personnel, and operating instructions should be strictly followed.

8.7 Occupational health and safety

8.7.1 All new personnel should be made aware of this Code, and in particular of its contents of specific reference to their activities.

8.7.2 Where there are no specific regulations, the general duties contained in the Chapter 1 apply. The main principle contained in the Chapter is that all safety measures should be based on an assessment of the risks involved in a particular task, and the identification of the most effective measures to limit that risk.

8.8 Employer and worker responsibilities

8.8.1 All new personnel should be informed of their employer's duties in respect of health and safety. The details are in the regulatory framework at the start of this Code.

8.8.2 It is particularly important that they are reminded to follow any training, oral or written instructions they have been given, and know to whom they should report any deficiencies in equipment or unsafe practices they may notice.

8.8.3 Personnel who find any defects in any equipment, or a condition they believe to be hazardous or unsafe, should immediately report it to a responsible person, who should take appropriate action.

8.9 Consultation procedures

8.9.1 New personnel must be told about the procedures for consultation on health and safety matters, who their safety representatives are (where applicable) and should be encouraged to contribute ideas to improve safety.

ANNEX 8.1

MARPOL ANNEX V

SUMMARY OF AT SEA GARBAGE DISPOSAL PROVISIONS

GARBAGE TYPE	ALL SHIPS EXCEPT PLATFORMS – Note 3		OFFSHORE PLATFORMS Note 3
	OUTSIDE SPECIAL AREAS (MARPOL Annex V/3)	IN SPECIALAREAS – Note 1 (MARPOL Annex V/5)	(MARPOL Annex V/4)
Plastics – include synthetic ropes and fishing nets and plastic garbage bags	Disposal prohibited	Disposal prohibited	Disposal prohibited
Floating dunnage, lining and packing materials	> 25 miles offshore	Disposal prohibited	Disposal prohibited
Paper, rags, glass, metal, bottles, crockery and similar refuse	> 12 miles	Disposal prohibited	Disposal prohibited
All other garbage including paper, rags, glass etc. comminuted or ground – Note 2	> 3miles	Disposal prohibited	Disposal prohibited
Food waste not comminuted or ground	> 12 miles	> 12 miles - Note 6	Disposal prohibited
Food waste comminuted or ground	> 3 miles	> 12 miles - Notes 5, 6	Disposal prohibited
Mixed refuse types	Note 4	Note 4	Note 4

Notes:

1. “Special areas” are as defined in MARPOL Annex V/1 and V/5.

2. Comminuted or ground garbage must be able to pass through a screen with mesh size no larger than 25mm.

3. Offshore platforms and associated ships include all fixed or floating platforms engaged in exploration or exploitation of seabed mineral resources, and all ships alongside or within 500 m of such platforms.

4. When garbage is mixed with other harmful substances having different disposal or discharge requirements, the more stringent requirement shall apply.

5. > 3 miles for Wider Caribbean.

6. A Cyprus ship shall not enter the Antarctic unless:

(a) It has sufficient capacity for the retention on board for all garbage while operating in the area.

(b) It has concluded arrangements for the retention of retained garbage at a reception facility after it has left the area (MARPOL V/5(5).

Chapter 9 - Fire Precautions

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

9.1 General

9.1.1 All the places shall be provided with sufficient and suitable fire fighting equipment as well as suitable fire detection and fire alarms where it is required. All the equipment, fire detection systems and fire alarms shall be maintained and tested by competent persons at regular time intervals to ensure their effectiveness for use.

9.1.2 The prevention of fire on board ship is of utmost importance. Sections 9.2 to 9.6 of this Chapter outline some important organisational measures that can be taken to reduce the risk of fire. Advice to seafarers is included in Chapter 10.

9.1.3 Chapter 10 deals with action in the event of fire and other emergency procedures.

9.2 Smoking

9.2.1 Conspicuous warning notices should be displayed in any part of the ship where smoking is forbidden (permanently or temporarily) and observance of them should be strictly enforced. Ashtrays or other suitable containers should be provided and used at places where smoking is authorised.

9.3 Electrical and other fittings

9.3.1 All electrical appliances should be firmly secured and served by permanent connections whenever possible.

9.3.2 Flexible leads should be as short as practicable and so arranged as to prevent them being chafed or cut in service.

9.3.3 Makeshift plugs, sockets and fuses should not be used.

9.3.4 Circuits should not be overloaded since this causes the wires to overheat, destroying insulation and thus resulting in a possible short-circuit which could start a fire. Notices should be displayed warning that approval should be obtained from a responsible officer to connect any personal electrical appliances to the ship’s supply.

9.3.5 All portable electrical appliances, lights etc. should have insulation readings taken before use, and should be isolated from the mains after use.

9.3.6 Electrical equipment which is to be used in any cargo area should be of an approved design.

9.3.7 It is important that all fixed electric heaters are fitted with suitable guards securely attached to the heater and that the guards are maintained in position at all times. Drying clothing on or above the heaters should not be permitted and suitably designed equipment should be supplied or areas designated.

9.3.8 When using drying cabinets or similar appliances, the ventilation apertures should not be obscured by overfilling of the drying space. Any screens or fine mesh covers around the ventilation apertures should be regularly inspected and cleaned, so that they do not become blocked by accumulated fluff from clothing.

9.3.9 The use of portable heaters should be avoided wherever possible. However, if they are required while the ship is in port (as temporary heating during repairs and as additional heating during inclement weather), a protective sheet of a non-combustible material should be provided to stand them on to protect wooden floors or bulkheads, carpets of linoleum. Portable heaters should be provided with suitable guards and should not be positioned close to furniture or other fittings. These heaters should never be used for drying clothes etc.

9.3.10 Personal portable space-heating appliances of any sort should not be used at sea and notices to this effect should be displayed.

9.3.11 The construction and installation of electric heaters should always be carried out in accordance with the relevant regulations and instructions or guidance supplied by the manufacturer.

9.4 Spontaneous combustion

9.4.1 Dirty waste, rags, sawdust and other rubbish – especially if contaminated with oil – may generate heat spontaneously which may be sufficient to ignite flammable mixtures or may set the rubbish itself on fire. Such waste and rubbish should therefore properly stored until it can be safely disposed of.

9.4.2 Materials in ship's stores, including linen, blankets and similar absorbent materials are also liable to ignite by spontaneous combustion if damp or contaminated by oil. Strict vigilance, careful stowage and suitable ventilation are necessary to guard against such a possibility. If such materials become damp, they should be dried before being stowed away. If oil has soaked into them, they should be cleaned and dried, or destroyed. They should not be stowed in close proximity to oil or paints, or on or near to steam pipes.

9.4.3 Where in connection with any process there may escape any dust, steam or gas of such a character and to such an extend as to be able to provoke an explosion on ignition, all steps shall be taken to prevent such explosions by enclosing the plant used in such process, and by removing or preventing the accumulation of dust, steam or gas.

9.4.4 Where any part of a plant contains any explosive, extremely or highly flammable gas or vapour under pressure greater than atmospheric pressure, that part shall not be opened unless adequate steps are taken to avoid risks to persons at work.

9.5 Machinery spaces

9.5.1 All personnel should be made fully aware of the precautions necessary to prevent fire in machinery spaces – in particular, the maintenance of clean conditions, the prevention of oil leakage and the removal of all combustible materials from vulnerable positions (see Chapters 14 and 21).

9.5.2 Suitable metal containers should be provided for the storage of cotton waste, cleaning rags or similar materials after use. Such containers should be emptied at frequent intervals and the content safely disposed of.

9.5.3 Wood, paints, spirits and tins of oil should not be kept in boiler rooms or machinery spaces including steering gear compartments.

9.5.4 All electric wiring should be well maintained and kept clean and dry. The rated capacity of the wires and fuses should never be exceeded.

9.6 Galleys

9.6.1 Galleys and pantries present particular fire risks (see Chapter 13). Care should be taken in particular to avoid overheating or spilling fat or oil and to ensure that burners or heating plates are shut off when cooking is finished. Extractor flues and ranges etc. should always be kept clean.

9.6.2 Means to smother fat or cooking oil fires, such as a fire blanket, should be readily available close to stoves. Remote cut-offs and stops should be conspicuously marked and known to galley staff.

Chapter 10 - Emergency Procedures

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

Paragraphs 10.1, 10.6 and 10.7 of this Chapter apply to such ships

10.1 Action in the event of fire

10.1.1 The risk of fire breaking out on board a ship cannot be eliminated but its effects will be much reduced if the advice given in this Chapter is conscientiously followed.

10.1.2 Training in fire-fighting procedures and maintenance of equipment should be assured by regular drills in accordance with section 10.2. Access to fire-fighting equipment should be kept clear at all times and emergency escapes and passage ways should never be obstructed.

10.1.3 A fire can usually be put out most easily in its first few minutes. Prompt and correct action is essential.

10.1.4 The alarm should be raised and the bridge informed immediately. If the ship is in port, the local fire authority should be called. If possible, an attempt should be made to extinguish or limit the fire, by any appropriate means readily available, either using suitable portable extinguishers or by smothering the fire as in the instance of a fat or oil fire in the galley.

10.1.5 The different types of portable fire extinguishers on board are appropriate to different types of fire. Water extinguishers should not be used on oil or electric fires.

10.1.6 Openings to the space should be shut to reduce the supply of air to the fire and to prevent it spreading. Any fuel lines feeding the fire or threatened by it should be isolated. If practicable combustible materials adjacent to the fire should be removed.

10.1.7 If a space is filling with smoke and fumes, any personnel not properly equipped with breathing apparatus should get out of the space without delay. If necessary, escape should be effected by crawling on hands and knees because air close to deck level is likely to be relatively clear.

10.1.8 After a fire has been extinguished, precautions should be taken against its spontaneous re-ignition.

10.1.9 Personnel should not re-enter a space in which a fire has occurred without wearing breathing apparatus until it has been fully ventilated.

10.2 Musters and drills

10.2.1 Musters and drills are required to be carried out regularly in accordance with the requirements of SOLAS, and they must be recorded in the official log book. The guidance contained in this and the following sections should be read in conjunction with SOLAS (III/19).

10.2.2 Musters and drills are designed to prepare, trained and organised response to dangerous situations which may unexpectedly threaten loss of life at sea. It is important that they should be carried out realistically, approaching as closely as possible to emergency conditions. Changes in the ship's function and changes in the ship's personnel from time to time should be reflected in corresponding changes in the muster arrangements.

10.2.3 The muster list must be conspicuously posted before the ship sails and, on international voyages and short international voyages should be supplemented by emergency instructions for each crew member (e.g. in the form of a card issued to each crew member or affixed to individual crew berths and bunks). These instructions should describe the allocated assembly and action, if any, to be taken on hearing such signals.

10.2.4 An abandon ship drill and a fire drill must be held within 24 hours of leaving port if more than 25% of the crew have not taken part in drills on board the ship in the previous month. As soon as possible but not later than two weeks after joining the ship, onboard training in the use of the ship's life-saving appliances, including survival craft equipment, must be given to crew members. As soon as possible after joining the ship, crew members should also familiarise themselves with their emergency duties, the significance of the various alarm systems and the locations of their lifeboat station and of all lifesaving and fire fighting equipment.

10.2.5 All the ship's personnel concerned should muster/assemble at a drill wearing lifejackets properly secured. The lifejackets should continue to be worn during lifeboat drills and launchings but in other cases may be subsequently removed at the master's discretion if they would impede or make unduly onerous the ensuing practice, provided they are kept ready to hand.

10.2.6 The timing of emergency drills should vary so that personnel who have not participated in a particular drill may take part in the next.

10.2.7 Any defects or deficiencies revealed during drills and the inspections which accompany them should be made good without delay.

10.3 Fire drills

10.3.1 Efficient fire-fighting demands the full co-operation of personnel in all departments of the ship. A fire drill should be held simultaneously with the first stage of the abandon ship drill. Fire-fighting parties should assemble at their designated stations. Engine room personnel should start the fire pumps in machinery spaces and see that full pressure is put on fire mains. Any emergency pump situated outside machinery spaces should also be started; all members of the crew should know how to start and operate the emergency pump.

10.3.2 The fire parties should be sent from their designated stations to the selected site of the supposed fire, taking with them emergency equipment such as axes and lamps and breathing apparatus. The locations should be changed in successive drills to give practice in differing conditions and in dealing with different types of fire so that accommodation, machinery spaces store rooms, galleys and cargo holds or areas of high fire hazard are all covered from time to time.

10.3.3 An adequate number of hoses to deal with the assumed fire should be realistically deployed. At some stage in the drill, they should be tested by bringing them into use, firstly with water provided by the main fire pump and secondly with water provided by the emergency fire pump alone.

10.3.4 The drill should extend, where practicable, to the testing and demonstration of the remote controls for ventilating fans, fuel pumps and fuel tank valves, the closing of openings and the appropriate isolation of electrical equipment.

10.3.5 Fixed fire extinguishing installations should be tested to the extent practicable.

10.3.6 Portable fire extinguishers should be available for demonstration of the manner of their use. They should include the different types applicable to different kinds of fire. At each drill, one extinguisher or more should be operated by a member of the fire party, a different member on each occasion. Extinguishers so used should be recharged before being returned to their normal location or sufficient spares should otherwise be carried for demonstration purposes.

10.3.7 Breathing apparatus should be worn by members of the fire-fighting parties so each member in turn has experience of its use. Search and rescue exercises should be undertaken in various parts of the ship. The apparatus should be cleaned and verified to be in good order before it is stowed; cylinders of self-contained breathing apparatus should be recharged or sufficient spare cylinders otherwise carried for this purpose.

10.3.8 In addition to the statutory inspection, fire appliances, fire and watertight doors, other closing appliances, and fire detection and alarm systems which have not been used in the drill should be inspected, either at the time of the drill or immediately afterwards.

10.4 Survival craft drills

10.4.1 When arranging drills reference should be made to SOLAS Regulation III/19. Arrangements for drills should take account of prevailing weather conditions.

10.4.2 Crew members taking part in liferaft or lifeboat drills should muster wearing warm outer clothing and lifejackets properly secured.

10.4.3 Where appropriate, the lowering gear and chocks should be inspected and a check made to ensure that all working parts are well lubricated.

10.4.4 When turning out davits or when bringing boats or rafts inboard under power, seamen should always keep clear of any moving parts.

10.4.5 The engines on motor lifeboats should be started and run ahead and astern. Care should be taken to avoid overheating the engine and the propeller shaft stern gland. All personnel should be familiar with the engine starting procedure.

10.4.6 Hand-operated mechanical propelling gear, if any, should be examined and similarly tested.

10.4.7 Radio life-saving appliances should be examined and tested, and the crew instructed in their use.

10.4.8 Water spray systems, where fitted, should be tested in accordance with the lifeboat manufacturer's instructions.

10.4.9 When a drill is held in port, as many as possible of the lifeboats should be cleared and swung out. Each lifeboat should be launched and manoeuvred in the water at least once every three months. Where launching of free-fall lifeboats is impracticable, they may be lowered into the water provided that they are free-fall launched at least once every six months. However, this may be extended to twelve months provided that arrangements are made for simulated launching which will take place at intervals not exceeding six months.

10.4.10 When fast rescue boats/rescue boats are carried which are not also lifeboats they should be launched and manoeuvred in the water every month so far as is reasonable and practicable. The interval between such drills, must not, exceed three months.

10.4.11 Where simultaneous off-load/on-load release arrangements are provided great car should be exercised to ensure that the hooks are fully engaged before a boat is recovered, after it has been stowed and prior to launching.

10.4.12 Where davit-launched liferafts are carried then on-board training, including an inflation, must be carried out at intervals not exceeding four months. Great care should be taken that the hook is properly engaged before taking the weight of the raft. The release mechanism should not be cocked until just prior to the raft landing in the water. If the raft used for the inflation is part of the ship's statutory equipment and not a special training raft, then it MUST be repacked at an approved service station.

10.4.13 Where the handle of the lifeboat winch would rotate during the operation of the winch, it should be removed before the boat is lowered on the brake or raised with an electric motor. If a handle cannot be removed, personnel should keep well clear of it.

10.4.14 Personnel in a fast rescue boat /rescue boat or survival craft being lowered should remain seated, keeping their hands inside the gunwale to avoid them being crushed against the ship's side. Lifejackets should be worn. In totally enclosed lifeboats seat belts should be secured. Only the launching crew should remain in a lifeboat being raised.

10.4.15 During drills, lifebuoys and lines should be readily available at the point of embarkation.

10.4.16 While the craft is in the water, crews should practice manoeuvring it by oar, or other power means and should operate the water spray system when fitted on enclosed lifeboats.

10.4.17 Seamen should keep their fingers clear of the long-link when unhooking or securing blocks onto lifting hooks while the boat is in the water, and particularly if there is a swell.

10.4.18 Before craft in gravity davits are recovered by power; the operation of the limit switches or similar devices should be checked.

10.4.19 A portable hoist unit to recover a craft should be provided with a clutch or have an attachment to resist the torque. These should be checked if neither device is available, the craft should be raised by hand.

10.4.20 Where liferafts are carried, instruction should be given to the ship's personnel in their launching, handling and operation. Methods of boarding them and the disposition of equipment and stores on them should be explained.

10.4.21 The statutory scale of life-saving appliances must be maintained at all times. If the use of a liferaft for practice would bring equipment below the specified scale, a replacement must first be made available.

10.5 Drills and rescue from dangerous spaces

10.5.1 Drills simulating the rescue of an incapacitated person from a dangerous space should be carried out every two months. Each drill should be recorded in the official log book. A drill should normally be held soon after significant changes in the crew members.

10.5.2 Any attempt to rescue a person who has collapsed within a space should be based on a pre-arranged plan, which should take account of the design of the individual ship. Allocation of personnel to relieve or back-up those first into the space should be borne in mind.

10.5.3 Regular drills should prove the feasibility of the ship's rescue plan under different and difficult circumstances. The space should be made safe or, for operational

convenience, a non-dangerous space may be used, provided that it provides realistic conditions for an actual rescue.

10.5.4 If there are indications that the person in the space is being affected by the atmosphere, the person outside the space should immediately raise the alarm. ON NO ACCOUNT SHOULD THE PERSON STATIONED AT THE ENTRANCE TO THE SPACE ATTEMPT TO ENTER IT BEFORE ADDITIONAL HELP HAS ARRIVED. NO ONE SHOULD ATTEMPT A RESCUE WITHOUT WEARING BREATHING APPARATUS AND A RESCUE HARNESS AND, WHENEVER POSSIBLE, USE OF A LIFELINE.

10.6 Assisting a casualty

10.6.1 Anyone on board ship may find a casualty, and everyone should know the basic priorities for action, the positioning of an unconscious casualty and how to give artificial respiration. These actions may save life until more qualified help arrives.

personnel encountering a casualty should first ensure that they are not themselves at risk;

if necessary the casualty should be removed from danger, or danger removed from the casualty – BUT SEE BELOW ON CASUALTIES IN AN ENCLOSED SPACE;

If there is only one unconscious casualty (irrespective of the total number of casualties)

- immediate basic treatment should be given to the unconscious casualty;
- then help should be summoned

If there is more than one unconscious casualty

- help should be summoned first;
- then appropriate treatment should be given, priority being given to any casualty with stopped breathing/heart

If the unconscious casualty is in an enclosed space

- personnel MUST NOT enter the enclosed space unless they are a trained member of a rescue team acting upon instruction;
- help should be summoned and the master informed;
- it must be assumed that the atmosphere in the space is unsafe. The rescue team must not enter unless wearing breathing apparatus;
- separate breathing apparatus or resuscitation equipment should also be fitted on the casualty as soon as possible;

- the casualty should be removed quickly to the nearest safe adjacent area outside the enclosed space unless his injuries and the likely time of evacuation makes some treatment essential before he is removed.

10.6.2 Should it be necessary to remove injured persons from a hold, the best available method should be adopted but where practicable all access openings should be opened and the following equipment used where available.

(a) a manually-operated davit, suitably secured over the access opening;

(b) a cage or stretcher fitted with controlling lines at the lower end.

10.6.3 Casualties who have been exposed to a hazardous chemical should rest quietly and be observed for at least 24 hours, in case any complications arise.

10.7 Dangerous Goods

10.7.1 Emergency responses to spillage of dangerous goods are contained in the IMO Medical First Aid Guide and the IMO Emergency Procedures for Ships Carrying Dangerous Goods (EmS). Both of these are available either as free-standing documents or incorporated into the International Maritime Dangerous Goods (IMDG) Code.

General

10.7.2 Recommendations on emergency action differ depending on where the goods are stowed and whether a substance is gaseous, liquid or solid. When dealing with incidents involving flammable gases or flammable liquids, all sources of ignition (e.g. naked lights, unprotected light bulbs, electric hand tools) should be avoided.

10.7.3 Normally dangerous goods in packaged form can be handled without the use of special protective clothing or equipment. If the packaging has been damaged the contents may have spilt or leaked. Under these circumstances the emergency team may have to deal with toxic corrosive or flammable solids, liquids or vapours. Vapours may arise from a spilt substance itself or as a result of the reaction between spilt substances themselves and other materials. Eye protection should always be worn, and if hazardous dust may be encountered, respiratory protection should be used – where the substance offers a significant toxic hazard this should be self-contained breathing apparatus.

Spillages

10.7.4 In general the recommendation is to wash spillages on deck overboard with copious quantities of water, and, where there is likely to be a dangerous reaction with water, from as far away as practicable. Disposal of dangerous goods overboard is a matter for judgment by the master, bearing in mind that the safety of the crew has priority over pollution of the sea. If it is safe to do so, spillages and leakages of substances, articles and materials identified in the IMDG Code as MARINE POLLUTANT should be collected for safe disposal. Absorbent material should be used for liquids.

10.7.5 Spillages collected with absorbent material and kept in plastic bags or other receptacles may need to be stowed safely for ultimate disposal ashore. Collection of

spillages with absorbent material under deck may not be fully effective, and precautions for entry into enclosed spaces should be observed.

10.7.6 A careful inspection for structural damage should be carried out after dealing with spillages of highly corrosive substances.

Fire

10.7.7 Water is generally recommended as the fire fighting medium for most dangerous goods at sea. However, reference should be made to the relevant EmS schedules.

10.7.8 Where possible, a package should be removed from the vicinity of the fire. Where there is a possibility that the heat will cause chemical or physical change in the substance, or affect the integrity of a package, leading to rupture and dispersal of the contents, keeping the packages cool may limit the hazard. Care should be exercised with those substances liable to polymerise, as this reaction can continue long after the removal of external heat.

10.7.9 For incidents under deck, the best course of fire fighting will usually be to batten down the hatch, exclude all ventilation and operate the fixed fire-fighting installation. Self-contained breathing apparatus should be worn when battening down the hatches or if there is any need to enter the space, for example after the fire is out.

10.7.10 For certain substances which are highly reactive with water, only the use of dry chemical fire extinguishers is recommended. This would not preclude the use of suitable powdered inert material if available in sufficient quantity. The only alternative is the use of copious quantities of water, which will have a cooling effect on the fire, although reacting with the substance.

10.7.11 Where an EmS advises against the use of foam, this does not preclude the use of special foams.

10.7.11 The general fire-fighting recommendations for a number of dangerous goods suggest that they should be jettisoned if there is a likelihood of their involvement in a fire. Where full or nearly full container loads or other units are concerned, this may be impractical, in which case everything possible should be done to prevent the spread of fire to those containers. If, despite preventative measures, fire seems likely to affect these containers, it should be borne in mind the contents may burn with explosive violence and personnel should be withdrawn accordingly.

Chapter 11 - Living on Board

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

11.1 General

11.1.1 The aim of the Code as a whole is to provide information and guidance aimed at improving the health and safety of those living and working on board ship. This Chapter gives some more specific advice for the individual seafarer.

11.2 Health and hygiene

11.2.1 It is the seafarer's responsibility to look after his own health and fitness. High standards of personal cleanliness and hygiene should be maintained.

11.2.2 On board ship, simple infections can easily be spread from one person to others. Thus preventive measures, as well as easily effective treatment, are essential.

11.2.3 Good health depends on sensible diet, adequate sleep and avoidance of recreational drugs, and substance or drug misuse, excesses of alcohol and tobacco. Regular exercise is also beneficial in maintaining good health.

11.2.4 Treatment should be sought straight away for minor injuries, cuts and abrasions should be cleaned and first aid treatment given as necessary to protect against infection. Barrier creams may help protect exposed skin against dermatitis and also make thorough cleansing easier.

11.2.5 The risk of contracting malaria in infected areas can be much reduced by taking precautions to avoid mosquito bites, for example by using mosquito wire-screening and nets, keeping openings closed, and using anti-mosquito preparations or insecticides.

11.2.6 Rats and other rodents may be carriers of infection and should never be handled, dead or alive, with bare hands.

Medication

11.2.7 Anyone taking medication, particularly any medication which may affect alertness, should notify a responsible officer, so that allowance may be made in allocating tasks.

11.2.8 Drinking alcohol whilst under treatment with medication should be avoided, since even common remedies such as aspirin, seasickness tablets, anti-malarial tablets and Codeine may be dangerous in conjunction with alcohol.

11.2.9 The individual has a responsibility to ensure that inoculations and vaccinations required for international voyages are kept up to date and medications for the prevention of illness, such as suitable anti-malarial tables, are taken when required.

11.2.10 Personnel on board ship are trained and equipped to provide initial medical care for the range of health problems that may arise. If a worker develops a serious health problem or suffers a serious injury, medical advice should be obtained by radio. Where necessary, arrangements may be made to transport the sick or injured worker ashore for medical treatment.

11.3 Working in hot climates

11.3.1 High humidity and heat can lead to heat exhaustion and heat stroke. Perspiration is the body's best heat control mechanism, but sweat consisting mainly of salt and water which must be replaced. When working in these conditions it is advisable to drink at least 4.5 litres (8 pints) of cool (but not iced) water daily. It is best to take small quantities at frequent intervals. Salt can be taken in food, supplemented by salt-containing drinks to prevent heat cramps. Alcohol should be avoided.

11.3.2 When working in enclosed spaces, these should be well ventilated. The minimum of light clothing should be worn, in order to allow the largest possible surface for free evaporation of sweat.

11.3.3 In tropical areas especially, exposure to the sun, particularly during the hottest part of the day, should be avoided as far as possible. When it is necessary to work in very strong sunlight, appropriate clothing offering protection to both head and body should be worn. Light cotton clothing will reflect the heat and help to keep the body temperature down.

11.3.4 When working in exceptionally hot and/or humid conditions or when wearing respiratory equipment, breaks at intervals in the fresh air or in the shade may be necessary.

11.4 Working clothes

11.4.1 Clothing should be appropriate for the working conditions. Working clothes should be close-fitting with no loose flaps, pockets or ties, which could become caught up in moving parts of machinery or on obstructions or projections. Where there is a risk of burning or scalding, as in galleys, clothing should adequately cover the body and material should be of low flammability, such as cotton or a cotton/terylene mix.

11.4.2 Shirts or overalls provide better protection if they have long sleeves. Long sleeves should not be rolled up. Long hair should be tied back and covered. Industrial or safety footwear should be worn when appropriate.

11.5 Shipboard housekeeping

11.5.1 Good housekeeping is an essential element in promoting health and safety on board;

equipment and other items should be safely and securely stored. This ensures not only that defects are discovered but articles can be found when required;

fixtures and fittings should be properly maintained;

all work and transit areas should be adequately lit;

electric circuits should not be overloaded, particularly in cabins;

garbage and waste materials should be cleared up and disposed of correctly and promptly;

doors and drawers should be properly secured;

instruction plates, notices and operating indicators should be kept clean and legible.

11.5.2 Many aerosols have volatile and inflammable contents. They should never be used or placed near naked flames or other heat source even when “empty”. Empty canisters should be properly disposed of.

11.5.3 Some fumigating or insecticidal sprays contain ingredients which, though perhaps themselves harmless to human beings, may be decomposed when heated. Smoking may be dangerous in sprayed atmospheres while the spray persists.

11.6 Substances hazardous to health

11.6.1 Many substances found on ships are capable of damaging the health of those exposed to them. They include not only recognised hazard substances, such as dangerous goods cargoes and asbestos, but also some domestic substances. For example caustic soda and bleaching powders or liquids can burn or penetrate the skin. They may react dangerously with other substances and ought never to be mixed.

11.6.2 The employer’s risk assessment will identify when personnel are working in the presence of substances hazardous to health, and evaluate the risks (see Chapter 1 and Chapter 26). Appropriate measures should be taken to remove, control or minimise the risk.

11.6.3 It is important to read carefully all labels on chemical containers before opening them, to find out about any hazards from the contents. A chemical from an unlabelled container should never be used unless it is clearly established what it is.

11.6.4 If asbestos-containing panels, cladding or insulation become loose or are damaged in the course of a voyage, pending proper repair, the exposed edges or surfaces should be protected by a suitable coating or covering to prevent asbestos fibres being released and dispersed in the air.

11.6.5 Prolonged exposure to mineral oils and detergents, may cause skin problems. All traces of oil should be thoroughly washed from the skin but hydrocarbon solvents should be avoided. Inadvertent contact with toxic chemicals or other harmful substances should be reported immediately and the appropriate remedial action taken. Working clothes should be laundered frequently. Oil-soaked rags should not be put in pockets.

11.6.6 Coughs and lung damage can be caused by breathing irritant dust. The risk is usually much greater for a person who smokes than for a non-smoker.

11.6.7 Employers are required to instruct, inform and train personnel so that they know and understand the risks arising from their work, the precautions to be taken and the results of any monitoring of exposure.

11.6.8 Personnel should always comply with any control measures in place, and wear any protective clothing and equipment supplied.

11.6.9 In cases where failure of the control measures could result in serious risks to health, or where their adequacy or efficiency is in doubt, health surveillance should be undertaken.

11.7 Common personal injuries

Hand injuries

11.7.1 Gloves are a sensible precaution when handling sharp or hot objects but may easily be trapped on drum ends and on machinery. Whilst loose-fitting gloves allow hands to slip out readily, they do not give a good grip on ladders. Wet or oily gloves may be slippery and great care should be taken when working in them.

Foot injuries

11.7.2 Unsuitable footwear, such as sandals, plimsolls and flip-flops, give little protection if there is a risk of burning or scalding, for example, and may lead to trips and falls. Chapter 4 gives advice on suitable footwear. Care should be taken to keep feet away from moving machinery, bights of ropes and hawsers.

Eye injuries

11.7.3 Great care should be taken to protect the eyes. Appropriate protective goggles should be worn for any work involving sparks, chips of wood, paint or metal and dangerous substances.

Head injuries

11.7.4 It is important to remember to duck, when stepping over coamings etc. to avoid hitting the head on the door frame.

Cuts

11.7.5 To avoid cuts all sharp implements and objects should be handled with care. They should not be left lying around where someone may accidentally cut themselves. In the galley, sharp knives and choppers should not be mixed with other items for washing up but cleaned individually and stored in a safe place. Broken glass should be swept up carefully, not picked by hand.

Smoking

11.7.6 Ashtrays should always be used where provided. Matches and cigarette ends should not be thrown overboard since there is a danger that they may be blown back on board. It is dangerous to smoke in bed. The use of safety ashtrays is to be preferred.

Burns and Scalds

11.7.7 Burns and scalds are commonly caused by hot pipelines and stoves, as well as by fires. Every hot machine and every container of scalding liquid should be regarded as a hazard, capable of causing injury and adequate precautions should be taken.

11.7.8 Faulty electrical equipment can cause severe burns as well as an electric shock. Equipment should be checked before use and if something appears wrong, it should be reported.

11.7.9 In hot climates, precautions should always be taken against sun burn and heat stroke.

Misuse of Tools

11.7.10 Injury can be caused by the misuse of tools. It is important always to use the correct tool for the job, and to make sure it is used in the right way. Tools should never be left lying around where they can fall on someone, or be tripped over. After a job is finished, they should be put away in a safe place.

Manual Handling

11.7.11 It is easy to strain muscles when manual handling. Pulled muscles may be avoided if proper lifting techniques are used. Chapter 18 gives guidance on handling loads.

Mooring

11.7.12 Mooring and unmooring operations provide the circumstances for potentially serious accidents. Personnel should never stand in the bight of a rope or near a rope under tension, and should treat ropes on drums and bollards with the utmost care.

Electrical hazards

11.7.13 Unauthorised persons should not interfere with electrical fittings. No personal electrical appliance should be connected to the ship’s electrical supply without approval from a responsible officer.

11.7.14 Clothing or other articles should be left to dry only in designated areas, not in machinery spaces or over or close to heaters or light bulbs. This may restrict the flow of air and so lead to overheating and fire.

11.7.15 Hand pressing irons should not be left standing on combustible materials. They should be switched off after use and stowed safely.

Chapter 12 - Safe Movement

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter, except paragraph 12.7, applies to such ships

12.1 General Advice

12.1.1 Personnel are reminded to take care as they move about the ship. In particular, the following points, though obvious, are all too often overlooked:

personnel should watch out for tripping hazards, and protrusions such as pipes, framing etc.;

the possibility of a sudden or heavy roll of the ship should always be borne in mind;

suitable footwear should be worn which will protect toes against accidental stubbing and falling loads, and will afford a good hold on deck and give firm support while using ladders; extra care should be taken when using ladders whilst wearing sea boots;

it is dangerous to swing on or vault over stair rails, guard-rails or pipes;

injuries are often caused by jumping off hatches etc.;

manholes and other deck accesses should be kept closed when not being used; guard-rails should be erected and warning signs posted when they are open;

spillage of oil, grease, soapy water etc. should be cleared up as soon as practicable;

areas made slippery by snow, ice or water should be treated with sand or some other suitable substance;

the presence of temporary obstacles should be indicated by appropriate warning signs;

litter and loose objects, e.g. tools, should be cleared up;

wires and ropes should be coiled and stowed;

lifelines should be rigged securely across open decks in rough weather;

ladders should be secured and ladder steps should be in good condition; care should be taken when using ladders and gangways providing access to or about the vessel, particularly when wearing gloves;

means of access to fire fighting equipment, emergency escape routes and watertight doors should never be obstructed.

12.2 Drainage

12.2.1 Decks which need to be washed down frequently or are liable to become wet and slippery, should be provided with effective means of draining water away. Apart from any open deck these places include the galley, the ship's laundry and the washing and toilet accommodation.

12.2.2 Drains and scuppers should be regularly inspected and properly maintained.

12.2.3 Where drainage is by way of channels in the deck, these should be suitably covered.

12.2.4 Duck boards, where used, should be soundly constructed and designed and maintained so as to prevent accidental tripping.

12.3 Transit Areas

12.3.1 Where necessary for safety, walkways on decks should be clearly marked, e.g. by painted lines or other means. Where a normal transit area becomes unsafe to use for any reason, the area should be closed until it can be made safe again.

12.3.2 Transit areas should where practicable have slip-resistant surfaces. Where an area is made slippery by snow, ice or water, sand or some other suitable substance should be spread over the area. Spillages of oil or grease etc. should be cleaned up as soon as possible.

12.3.3 When rough weather is expected, life-lines should be rigged securely across open decks.

12.3.4 Gratings in the deck should be properly maintained and kept closed when access to the space below is not required.

12.3.5 Permanent fittings which may cause hazards to movement, e.g. pipes, single steps, framing, door arches, top and bottom rungs of ladders, should be made conspicuous by use of contrasting colouring, marking, lighting or signing. Temporary obstacles can also be hazardous and, if they are to be there for some time, they should be marked by appropriate warning signs.

12.3.6 When at sea, any gear or equipment stowed to the side of a passageway or walkway should be securely fixed or lashed against the movement of the ship.

12.3.7 Litter and loose objects, e.g. tools, should not be left lying around. Wires and ropes should be stowed and coiled so as to cause least obstruction.

12.3.8 Particular attention should be given to areas to which shore-based workers and passengers have access, especially on deck, as they will be less familiar with possible hazards.

12.3.9 When deck cargo is being lashed and secured, special measures may be needed to ensure safe access to the top of, and across, the cargo.

12.4 Lighting

12.4.1 The level of lighting should be such as to enable obvious damage to, or leakage from, packages to be seen. When there is a need to read labels or container plates or to distinguish colours the level of lighting should be adequate to allow this, or other means of illumination should be provided.

12.4.2 Lighting should be reasonably constant and arranged to minimise glare and dazzle, the formation of deep shadows and sharp contrasts in the level of illumination between one area and another.

12.4.3 Where visibility is poor, e.g. due to fog, clouds of dust, or steam, which could lead to an increase in the risks of accidents occurring, the level of lighting should be increased above the recommended minimum.

12.4.4 Lighting facilities should be properly maintained. Broken or defective lights should be reported to the responsible person and repaired as soon as practicable.

12.4.5 Before leaving an illuminated area or space a check should be made that there are no other persons remaining within that space before switching off or removing lights.

12.4.6 Unattended openings in the deck should either be kept illuminated or be properly or safely closed before lights are switched off.

12.4.7 When portable or temporary lights are in use, the light supports and leads should be arranged, secured or covered so as to prevent a person tripping, or being hit by moving fittings, or walking into cables or supports. Any slack in the leads should be coiled. The leads should be kept clear of possible causes of damage e.g. running gear, moving parts of machinery, equipment and loads. If they pass through doorways, the doors should be secured open. Leads should not pass through doors in watertight bulkheads or fire door openings when the ship is at sea. Portable lights should never be lowered or suspended by their leads.

12.4.8 Where portable or temporary lighting has to be used fittings and leads should be suitable and safe for the intended usage. To avoid risks of electric shock from mains voltage, the portable lamps used in damp or humid conditions should be of low voltage, preferably 11 volts, or other suitable precautions taken.

12.5 Guarding of Openings

12.5.1 Hatchways open for handling cargo or stores, through which persons may fall or on which they may trip, should be closed as soon as work stops, except during short interruptions of where they cannot be closed without endangering safety or mechanical efficiency because of the heel or trim of the ship.

12.5.2 The guard-rails or fencing should have not sharp edges and should be properly maintained. Where necessary, locking devices and suitable stops or toe-boards should be provided. Each course of rails should be kept substantially horizontal and taut throughout their length.

12.5.3 Guard-rails or fencing should consist of an upper rail at a height of 1 metre and an intermediate rail at a height of 0.5 metres. The rails may consist of taut wire or taut chain.

12.5.4 Where the opening is a permanent access way, or where work is in progress which could not be carried out with the guards in place, guards do not have to be fitted during short interruptions in the work – e.g. for meals, although warning signs should be displayed where the opening is a risk to other persons.

12.6 Watertight doors

12.6.1 All members of the crew who would have occasion to use any watertight doors should be instructed in their safe operation.

12.6.2 Particular care should be taken when using power operated watertight doors which have been closed from the bridge. If opened locally under these circumstances the door will re-close automatically with a force sufficient to crush anyone in its path as soon as the local control has been released. The local controls are positioned on each side of the door so that a person passing through may open the door and then reach to the other control to keep the door in the open position until transit is complete. As both hands are required to operate the controls, no person should attempt to carry any load through the door unassisted.

12.6.3 Notices clearly stating the method of operation of the local controls should be prominently displayed on both sides of each watertight door.

12.6.4 No-one should attempt to pass through a watertight door when it is closing and/or the warning bell is sounding.

12.7 Ship-board Vehicles

12.7.1 Persons selected to drive ships' powered vehicles and powered mobile lifting appliances should be fit to do so, and have been trained for the particular category of vehicle or mobile lifting appliance to be driven, and tested for competence.

12.7.2 Authorisations of crew members should either be individually issued in writing or comprise a list of persons authorised to drive. These authorisations may need to be made available for inspection to Dock Authorities.

12.7.3 Maintenance of ships' powered vehicles and powered mobile lifting appliances should be undertaken in accordance with manufacturers' instructions.

12.7.4 Drivers of ships' powered vehicles and powered mobile lifting appliances should exercise extreme care, particularly when reversing.

Chapter 13 - Food Preparation and Handling

13.1 Health and hygiene
13.2 Slips, falls and tripping hazards
13.3 Galley stoves, steam boilers and deep fat fryers
13.4 LPG appliances
13.5 Deep fat frying
13.6 Microwave ovens
13.7 Catering equipment
13.8 Knives, saws, choppers etc.
13.9 Refrigerated rooms and store rooms

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

13.1 Health and hygiene

13.1.1 Catering staff should have a basic knowledge of food safety and hygiene as they have responsibility for ensuring that high standards of personal hygiene and cleanliness of the galley, pantry and mess rooms are always maintained. The Guidelines on Food and Water (see appendix 2) of this Code give further advice on this.

13.1.2 There should be no smoking in galleys, pantries, store rooms or other places where food is prepared.

13.1.3 Hands and fingernails should be washed before handling food using a dedicated wash hand-basin, a bacterial liquid soap from a dispenser and disposable towels or another individual method of hand drying such as a hot air dryer. It is important to wash hands after using the toilet, blowing your nose, or handling refuse or contaminated food.

13.1.4 All cuts, however small, should be reported immediately and receive first aid attention to prevent infection.

13.1.5 An open cut, burn or abrasion should be covered with a coloured waterproof dressing which must be changed regularly. Anyone with a septic cut or a boil, stye etc. should stop working with food until it is completely healed.

13.1.6 Illness, rashes or spots, however mild should be reported immediately when the symptoms appear.

13.1.7 A person suffering from diarrhoea and vomiting, which are signs of food poisoning, should not work in food handling areas until medical clearance has been given.

13.1.8 Catering staff should wear clean protective clothing when handling food and preparing meals.

13.1.9 Catering staff should not wear jewellery apart from a plain wedding band.

13.1.10 Cleanliness of all food, crockery, cutlery, linen, utensils, equipment and storage is vital. Cracked or chipped crockery and glassware should be destroyed. Foodstuffs which may have come into contact with broken glass or broken crockery should be thrown away.

13.1.11 As a general rule fresh fruit and salad should be thoroughly washed in fresh water before being eaten.

13.1.12 Foodstuffs and drinking water should not be stored where germs can thrive. Frozen food must be defrosted in controlled conditions, i.e. an area entirely separate from other foods in cool conditions. Food should be prevented from sitting in the thaw liquid by placing it on grids in a container or on a shelf. Deep frozen food which has been defrosted is not to be refrozen.

13.1.13 The risks of cross contamination should be eliminated by thoroughly stripping and cleaning the relevant parts of equipment when successive different foods are to be used (especially raw and cooked foods). It is important to wash hands after handling raw meat, fish, poultry or vegetables.

13.1.14 Raw food should be kept apart from cooked food or food that required no further treatment before consumption (e.g. milk). Separate refrigerators are preferred although if stored in the same unit, the raw food must always be placed at the bottom to avoid drips contaminating ready prepared food. Food should also be covered to prevent drying out, cross-contamination and absorption of odour.

13.1.15 Separate work surfaces, chopping boards and utensils should be set aside for the preparation of raw meat and must not be used for the preparation of foods which will be eaten without further cooking. Colour coding is an established way of ensuring separation between the two activities.

13.1.16 Ensure all food is kept at the correct temperature to prevent the multiplication of bacteria.

13.1.17 Crockery and glassware should not be left submerged in washing up water where it may easily be broken and cause injury. Such items should be washed up individually as should knives and any utensils or implements with sharp edges. Crockery, glassware and utensils should preferably be washed in a dishwasher, where much higher temperatures can be achieved compared with hand washing.

13.1.18 Some domestic cleaning substances contain bleach or caustic soda (sodium hydrochloride) whilst some disinfectants contain carbolic acid (phenol). These substances can burn the skin and they are poisonous if swallowed. They should be treated with caution and should not be mixed together or used at more than the recommended strength. Inadvertent contact with toxic chemicals or other harmful substances should be reported immediately and the appropriate remedial action taken. Cleaning substances, materials, should be stored in a suitable locker/cupboard separate from food handling areas.

13.1.19 Food waster, empty food containers and other garbage are major sources of pollution and disease and should be placed in proper storage facilities safely away from foodstuffs. Their discharge into the sea is prohibited except in circumstances specified in Annex 8.1 to this Code.

13.2 Slips, falls and tripping hazards

13.2.1 Suitable footwear, preferably with slip-resistant soles, should be worn at all times. A large proportion of injuries to catering staff arise because they wear unsuitable footwear such as sandals, plimsolls or flip-flops, which do not grip greasy decks or protect the feet from burns or scalds if hot or boiling liquids are spilt.

13.2.2 Decks, and particularly stairs, should be regularly maintained so that cracks and worn areas do not cause a tripping hazard.

13.2.3 Decks and gratings should be kept clear from grease, rubbish and ice etc. to avoid slipping. Any spillage should be cleared up immediately.

13.2.4 Broken glass or crockery should be cleared away with a brush and pan – never with bare hands.

13.2.5 The area of deck immediately outside the entrance to refrigerated rooms should always be kept free to grasp the handrail.

13.2.6 Care should always be taken when using stairs and companionways; one hand should always be kept free to grasp the handrail.

13.2.7 Trays, crates, cartons etc. should not be carried in such fashion that sills, storm steps or other obstructions in the path are obscured from view.

13.2.8 Lifts that involve reaching up too high or too low should be avoided. Personnel should not stand on unsecured objects to reach articles which are out of reach.

13.3 Galley stoves, steam boilers and deep fat fryers

13.3.1 Ships using oil fired stoves should operate safety procedures according to manufacturers' instructions, particularly when lighting the stove. Instructions should be clearly displayed in the galley.

13.3.2 Catering staff should not attempt to repair electric or oil-fired ranges or electric microwave ovens. Defects should always be reported so that proper repairs may be made. The equipment should be kept out of use and a warning notice displayed until it has been repaired.

13.3.3 The indiscriminate use of water in hosing down and washing equipment in the galley can be very dangerous, particularly when there are electrical installations. Whenever the galley deck is washed down, power to an electric range and all electric equipment should be switched off and isolated from the supply and water kept from contact with the electric equipment.

13.3.4 Range guard rails should always be used in rough weather. Pots and pans should never be filled to the extent that the contents spill over when the ship rolls.

13.3.5 All catering staff should be fully instructed in avoiding burns from hot surfaces on hot serving tables, bain marie, steamers and tilting pans.

13.3.6 Dry cloths or pot holders and oven gloves (long enough to cover the arms) should always be used to handle hot pans and dishes. Wet cloths conduct heat quickly and may scald the hands.

13.3.7 No one should be directly in front of an oven when the door is opened – the initial heat blast can cause burns.

13.3.8 The steam supply to pressure cookers, steamers and boilers should be turned off and pressure released before their lids are opened.

13.4 LPG appliances

13.4.1 Suitable means for detecting the leakage of gas should be provided and securely fixed in the lower part of the galley as gas is heavier than air. A gas detector should incorporate an audible and a visible alarm, and should be tested frequently. A suitable notice, detailing the action to be taken when an alarm is given by the gas detection system should be prominently displayed.

13.4.2 Equipment should be fitted, where practicable, with an automatic gas shut-off device which operates in the event of flame failure.

13.4.3 When gas burning appliances are not in use the controls should be turned off. If they are not going to be used again for some length of time, the main regulators close to the storage bottles should be shut.

13.4.4 A safe system of working, training and supervision over lighting and operating procedures should be established.

13.4.5 Defects in joints, valves and connections can be detected by smell. Catering staff should not attempt to repair electric, oil or gas appliances.

13.5 Deep fat frying

13.5.1 Water should never be poured into hot oil; the water turns to steam, throwing the oil at a considerable distances. This may cause severe burns to personnel, and possibly start a fire.

13.5.2 If fat catches fire in a container, the flames should be smothered using a fire blanket if practicable and the container removed from the source of heat. Otherwise a suitable fire extinguisher should be used. In no circumstances should water be used.

13.5.3 The flash point of the cooking medium should be no lower than 315°C (600°F).

13.5.4 Deep fat fryers should be provided with suitable safety lids which should be kept in position when the fryers are not in use.

13.5.5 To minimise the risk of fire from failure of the control thermostat all deep fat fryers should be fitted with a second thermostat set to provide a thermal cut-off.

13.5.6 Electrically operated deep fat fryers should be switched off immediately after use.

13.5.7 A safe system of work for cleaning and draining fat fryers should be established.

13.5.8 A strict schedule of cleaning of galley uptakes/grills should be established so that fat deposits are not allowed to accumulate.

13.5.9 A notice should be prominently displayed detailing the action to be taken in the event of a deep fat fryer fire.

13.6 Microwave ovens

13.6.1 When microwave ovens are used, it is important to ensure that the food is cooked thoroughly and evenly. This is particularly important with deep frozen foods which should be thoroughly defrosted before cooking. The instructions issued by the oven manufacturers should be followed carefully in conjunction with the information on the packaging of the foodstuff.

13.6.2 No microwave oven should be operated if the oven door or its interlock is out of order, the door broken or ill-fitting or the door seals damaged. Each microwave oven should carry a permanent notice to this effect. Microwave radiation checks should be carried out at regular intervals.

13.7 Catering equipment

13.7.1 Except under the supervision of an experienced person, no one should use catering equipment unless trained in its use and fully instructed in the precautions to be observed.

13.7.2 Dangerous parts of catering machines should be properly guarded and the guards kept in position whenever the machine is used.

13.7.3 Any machine or equipment that is defective in its parts, guards or safety devices should be reported and taken out of service, with power disconnected, until repaired.

13.7.4 When a power-operated machine has to be cleaned or a blockage in it removed, it should be switched off and isolated from the power supply. Some machines will continue to run down for a while thereafter, and care should be taken to see that dangerous parts have come to rest before cleaning is begun.

13.7.5 A safe procedure for cleaning all machines should be established and carefully followed. Every precaution should be taken where cutting edges, for example on slicing machines, are exposed by the necessary removal of guards to allow thorough cleaning. Guards should be properly and securely replaced immediately after the job is done.

13.7.6 Unless properly supervised, a person under 18 years of age should not clean any power operated or manually driven machine with dangerous parts which may move during the cleaning operation.

13.7.7 Appropriate implements, not fingers, should be used to feed materials into processing machines.

13.7.8 Electrical equipment should not be used with wet hands.

13.7.9 All electrical equipment should be regularly inspected by a competent person.

13.8 Knives, saws, choppers etc.

13.8.1 Sharp implements should be treated with respect and handled with care at all times. They should not be left lying around working areas where someone may accidentally cut themselves. They should not be mixed in with other items for washing up but cleaned individually and should be stored in a safe place.

13.8.2 Knives should be kept tidily in secure racks or sheaths when not in use.

13.8.3 The handles of knives, saws, choppers etc. should be securely fixed and kept clean and free from grease. The cutting edges should be kept clean and sharp.

13.8.4 Proper can openers in clean condition should be used to open cans; improvisations are dangerous and may leave jagged edges on the can.

13.8.5 Chopping meat requires full attention. The chopping board must be firm, the cutting area of the meat well on the block and hands and body clear of the line of strike. There must be adequate room for movement and no obstructions in the way of the cutting stroke. Particular care is required when the vessel is moving in a seaway.

13.8.6 Foodstuffs being chopped with a knife should not be fed towards the blade with outstretched fingers. Fingertips should be set inwards towards the palm of the hand with the thumb overlapped by the forefinger. The knife blade should be angled away from the work and so away from the fingers.

13.8.7 A falling knife should be left to fall, not grabbed.

13.8.8 A meat saw should be guided by the forefinger of the free hand over the top of the blade. The use of firm even strokes will allow the blade to feed its way, if forced, the saw may jump possibly causing injury.

13.9 Refrigerated rooms and store rooms

13.9.1 All refrigerated room doors should be fitted with means both of opening the door and of sounding the alarm from the inside.

13.9.2 A routine testing of the alarm bell and checking of the door clasps and inside release should be carried out regularly, at least at weekly intervals.

13.9.3 Those using the refrigerated room should make themselves familiar with the operation, in darkness, of the inside release for the door and the location of the alarm button.

13.9.4 All refrigerated room doors should be fitted with an arrangement of adequate strength to hold the door open in a seaway and should be secured open while stores are being handled. These doors are extremely heavy and can cause serious injury to a person caught between the door and the jamb.

13.9.5 Anyone going into a refrigerated room should take the padlock, if any, inside with him. Another person should be informed.

13.9.6 Cold stores or refrigerated rooms should not be entered if it is suspected that there has been a leakage of refrigerant. A warning notice to this effect should be posted outside the doors.

13.9.7 All stores and crates should be stowed securely so that they do not shift or move in a seaway.

13.9.8 When wooden boxes or crates are opened, protruding fastenings should be removed or made safe.

13.9.9 Metal hooks not in use should be stowed in a special container provided for the purpose. Where hooks cannot be removed they should be kept clear.

Section 3- Work Activities

Chapter 14 - Safe Systems of Work

Application to fishing vessels which operate outside territorial waters

This chapter, except paragraphs 14.5 and 14.6, applies to such ships **[note that there are various references in the chapter to duty officer and engineer officer which suggests that the whole chapter should not apply to fishing vessels]**

14.1 Introduction

14.1.1 This Chapter suggests some control measures which may be taken to protect those who may be put at risk in some key areas on board ship. Such measures should be based on the findings of the risk assessment.

14.2 Working aloft and outboard

14.2.1 Personnel working at a height may not be able to give their full attention to the job and at the same time guard themselves against falling. Proper precautions should therefore always be taken to ensure personal safety when work has to be done aloft or when working outboard. It must be remembered that the movement of a ship in a seaway and extreme weather conditions even when alongside, will add to the hazards involved in work of this type. A stage or ladder should also be utilised when work is to be done beyond normal reach.

14.2.2 Personnel under 18 years of age or with less than 11 months experience at sea, should not work aloft unless accompanied by an experienced person or otherwise adequately supervised.

14.2.3 Personnel working aloft (above 2 metres) should wear a safety harness with lifeline or other arresting device at all times (see section 4.10). A safety net should be rigged where necessary and appropriate. Additionally, where work is done overside, buoyancy garments should be worn and a lifebuoy with sufficient line attached should be kept ready for immediate use. Personnel should be under observation from a person on deck.

14.2.4 Other than emergency situations personnel should not work overside whilst the vessel is underway. If such work has to be undertaken lifeboats or rescue boats should be ready for immediate use. Any such work should be closely monitored/watched by a responsible person.

14.2.5 Before work is commenced near the ship's whistle, the officer responsible should ensure that power is shut off and warning notices posted on the bridge and in the machinery spaces.

14.2.6 Before work is commenced on the funnel, the officer responsible should inform the duty engineer to ensure that steps are taken to reduce as far as practicable the emission of steam, harmful gases and fumes.

14.2.7 Before work is commenced in the vicinity of radio aerials, the officer responsible should inform the radio room or person in charge of radio equipment so that no transmissions are made whilst there is risk to personnel. A warning notice should be put up in the radio room.

14.2.8 Where work is to be done near the radar scanner, the officer responsible should inform the officer on watch so that the radar and scanner are isolated. A warning notice should be put on the set until the necessary work has been completed.

14.2.9 On completion of the work of the type described above, the person responsible should, where necessary, inform the appropriate person that the precautions taken are no longer required and that warning notices can be removed.

14.2.10 Work aloft (above 2 metres) should not be carried out in the vicinity of cargo working, unless it is essential. Care must always be taken to avoid risks to anyone working or moving below. Suitable warning notices should be displayed. Tools and stores should be sent up and lowered by a line in suitable containers. Containers when not in use should be securely stowed in the same place for stowage of tools or materials not presently being used.

14.2.11 No one should place tools where they can be accidentally knocked down and may fall on someone below, nor should tools be carried in pockets from which they may easily fall. When working aloft it is often best to wear a belt designed to hold essential tools securely in loops.

14.3 Portable ladders

14.3.1 A portable ladder should only be used where no safer means of access is reasonably practicable. It is very important that the ladder is checked regularly by a competent person.

14.3.2 Wooden ladders should not be painted or treated so as to hide defects and cracks. When not in use they should be stowed safely in a dry ventilated space away from any heat source.

14.3.3 Portable ladders should be pitched between 60° and 75° from the horizontal, on a firm base, properly secured against slipping or shifting sideways and be so placed as to

afford a clearance of at least 140 mm behind the rungs. Where practicable the ladder should extend to at least 1 metre above any upper landing place unless there are other suitable handholds.

14.3.4 When portable extending ladders are in use, there should be sufficient overlap between the extensions.

14.3.5 Personnel negotiating a ladder should use both hands, and not attempt to carry tools or equipment in their hands.

14.3.6 Planks should not be suspended on rungs of ladders to be used as staging, nor should ladders be used horizontally for such purposes.

14.3.7 Working from ladders should be avoided as far as possible, but where necessary, and for heights greater than 2 metres above base level, personnel must use a safety harness with lifeline secured above the work position.

14.4 Cradles and stages

14.4.1 Cradles should be at least 430 mm (17 inches) wide and fitted with guard rails or stanchions with taut ropes to a height of one metre (39 inches) from the floor. Toe boards add safety.

14.4.2 Planks and materials used for the construction of ordinary plank stages must be carefully examined to ensure adequate strength and freedom from defect.

14.4.3 Wooden components of staging should be stowed in a dry, ventilated space and not subjected to heat.

14.4.4 Ancillary equipment, lizards, blocks and gantlines should be thoroughly examined before use.

14.4.5 When a stage is rigged over side, the two gantlines used in its rigging should be at least long enough to trail into the water to provide additional lifelines should the operator fall. A lifebuoy and line should be kept ready at a close position.

14.4.6 Gantlines used for working aloft should not be used for any other purpose and should be kept clear of sharp edges when in use.

14.4.7 The anchoring points for lines, blocks and lizards must be of adequate strength and, where practicable, be permanent fixtures to the ship's structure. Integral lugs should be hammer tested. Portable rails or stanchions must not be used as anchoring points. Any anchoring points should be treated as lifting points and should be inspected/tested in accordance with Chapter 20 of this Code.

14.4.8 Stages and staging which are not suspended should always be secured against movement. Hanging stages should be restricted against movement to the extent practicable.

14.4.9 In machinery spaces, staging and its supports should be kept clear of contact with hot surfaces and moving parts of machinery. In the engine room, a crane gantry should

not be used directly as a platform for cleaning or painting, but can be used as the base for a stable platform if suitable precautions are taken (see section 23.3.6).

14.4.10 Where personnel working from a stage are required to raise or lower themselves, great care must be taken to keep movements of the stage small and closely controlled.

14.5 Bosun's chair

14.5.1 When used with a gantline the chair should be secured to it with a double sheet bend and the end seized to the standing part with adequate tail.

14.5.2 Hooks should not be used to secure bosun's chairs unless they are of the type which because of their special construction cannot be accidentally dislodged, and have a marked safe working load which is adequate for the purpose.

14.5.3 On each occasion that a bosun's chair is rigged for use, the chair, gantlines and lizards must be thoroughly examined, and renewed if there is any sign of damage, and load tested at least 4 times the load they will be required to lift before a person is hoisted.

14.5.4 When a chair is to be used for riding topping lifts or stays, it is essential that the bow of the shackle, and not the pin, rides on the wire. The pin in any case should be seized.

14.5.5 When it is necessary to haul a person aloft in a bosun's chair it should be done only by hand; a winch should not be used.

14.5.6 If a worker is required to lower himself while using a bosun's chair, he should first frap both parts of the gantline together with a suitable piece of line to secure the chair before making the lowering hitch. The practice of holding on with one hand and making the lowering hitch with the other is dangerous. It may be prudent to have someone standing by to tension the lines.

14.6 Working from punts

14.6.1 Punts should be stable and provided with suitable fencing. Unsecured trestles and planks should not be used to give additional height.

14.6.2 The person in charge should have due regard to the strength of tides and other hazards, such as wash from passing vessels, before a punt is put to use.

14.6.3 When work is to be done at or near the stern or other propeller aperture, the person in charge should inform the duty engineer and deck officers so that warning notices are put up in the engine room, at the controls and on the bridge.

14.6.4 The duty engineer and deck officers should also be informed by the person in charge when seamen are working below ship's side discharges so they are not used until the work is completed. Notices to this effect should be attached to the relevant control valves and not taken off until those working are reported clear.

14.7 Work in machinery spaces

14.7.1 Every dangerous part of a ship's machinery must be securely guarded unless it is so positioned or constructed so that it is as safe as if it were securely guarded or is otherwise safeguarded.

14.7.2 All steam pipes, exhaust pipes and fittings which by their location and temperature present a hazard, should be adequately lagged or otherwise shielded. The insulation of hot surfaces should be properly maintained particularly in the vicinity of oil systems.

14.7.3 Personnel required to work in machinery spaces which have high noise levels should wear suitable hearing protectors (see section 4.6).

14.7.4 Where a high noise level in a machinery space, or the wearing of ear protectors, may mask an audible alarm, a visual alarm of suitable intensity should be provided, where practicable, to attract attention and indicate that an audible alarm is sounding. This should preferably take the form of a light or lights with rotating reflectors. Guidance may be found in the IMO Code on Alarms and Indicators.

14.7.5 The source of any oil leakage should be located and repaired as soon as practicable.

14.7.6 Waste oil should not be allowed to accumulate in the bilges or on tank tops. Any leakage of fuel, lubricating and hydraulic oil should be disposed of in accordance with MARPOL at the earliest opportunity. Tank tops and bilges should, wherever practicable, be painted a light colour and kept clean and well-illuminated in the vicinity of pressure oil pipes so that leaks may be readily located.

14.7.7 Great caution is required when filling any settling or other oil tank to prevent it overflowing, especially in an engine room where exhaust pipes or other hot surfaces are directly below. Manholes or other openings in the tanks should always be secured so that should a tank be overfilled the oil is directed to a safe place through the overflow arrangements.

14.7.8 Particular care should be taken when filling tanks which have their sounding pipes in the machinery spaces to ensure that weighted cocks are closed. In no case should a weighted cock on a fuel or lubricated oil tank sounding pipe or on a fuel, lubricating or hydraulic oil tank gauge be secured in the open position.

14.7.9 Engine room bilges should at all items be kept clear of rubbish and other substances so that mud-boxes are not blocked and the bilges may be readily and easily pumped.

14.7.10 Remote controls fitted for stopping machinery or pumps or for operating oil-tank quick-closing valves in the event of fire, should be tested regularly to ensure that they are functioning satisfactorily. This also applies to the controls on fuel storage daily service tanks (other than double bottoms) and lubricating oil tanks.

14.7.11 Cleaning solvents should always be used in accordance with manufacturers' instructions and in an area that is well ventilated.

14.7.12 Care should be taken to ensure that spare gear is properly stowed and items of machinery under overhaul safely secured so that they do not break loose and cause injury or damage even in the heaviest weather.

14.8 Boilers

14.8.1 A notice should be displayed at each boiler setting out operating instructions. Information provided by the manufacturers of the oil-burning equipment should be displayed in the boiler room.

14.8.2 To avoid danger of a blowback when lighting boilers, the correct flashing up procedure should always be followed:

(a) there should be no loose oil on the furnace floor;

(b) the oil should be at the correct temperature for the grade of oil being used; if not the temperature of the oil must be regulated before lighting is attempted;

(c) the furnace should be blown through with air to clear any oil vapour;

(d) the torch, specially provided for the purpose, should always be used for lighting a burner unless an adjacent burner in the same furnace is already lit; other means of ignition, such as introducing loose burning material into the furnace, should not be used. An explosion may result from attempts to relight a burner from the hot brickwork of the furnace;

(e) if all is in order, the operator should stand to one side, and the lighted torch inserted and fuel turned on. Care should be taken that there is not too much oil on the torch which could drip and possibly cause a fire;

(f) if the oil does not light immediately, the fuel supply should be turned off and the furnace ventilated by allowing air to blow through for two or three minutes to clear any oil vapour before a second attempt to light is made. During this interval the burner should be removed and the atomizer and tip inspected to verify that they are in good order;

(g) if there is a total flame failure while the burner is alight, the fuel supply should be turned off.

14.8.3 The avenues of escape from the boiler fronts and firing spaces should be kept clear.

14.8.4 Where required to be fitted, the gauge glass cover should always be in place when the glass is under pressure. If a gauge glass or cover needs to be replaced or repaired, the gauge should be shut off and drained before the cover is removed.

14.9 Unmanned machinery spaces

14.9.1 Personnel should never enter or remain in an unmanned machinery space alone, unless they have received permission from, or been instructed by the engineer officer in charge at the time. They may only be sent to carry out a specific task which they may be expected to complete in a comparatively short time. Before entering the space, at regular intervals whilst in the space and on leaving the space, they must report by telephone, or other means provided, to the duty deck officer. Before they enter the space the method of reporting should be clearly explained. Consideration should be given in appropriate instances to using a "permit-to-work" (see section 15.2).

14.9.2 If it is the engineer officer in charge who enters the machinery space alone, he too should report to the deck officer.

14.9.3 Notice of safety precautions to be observed by personnel working in unmanned machinery spaces should be clearly displayed at all entrances to the space. Warning should be given that in unmanned machinery spaces there is a likelihood of machinery suddenly starting up.

14.9.4 Unmanned machinery spaces should be adequately illuminated at all times.

14.9.5 When machinery is under bridge control, the bridge should always be advised when a change in machinery setting is contemplated by the engine room staff, and before a reversion to engine room control of the machinery.

14.10 Refrigeration machinery

14.10.1 Adequate information should be available on each vessel, laying down the operation and maintenance safeguards of the refrigeration plant, the particular properties of the refrigerator and the precautions for its safe handling.

14.10.2 No one should enter a refrigerated compartment without first informing a responsible officer.

14.10.3 The compartment or flat in which refrigeration machinery is fitted should be adequately ventilated and illuminated. Where fitted, both the supply and exhaust fans to and from compartments in which refrigeration machinery is situated should be kept running at all times. Inlets and outlets should be kept unobstructed. Where there is any doubt as to the adequacy of the ventilation, a portable fan or other suitable means should be used to assist in the removal of toxic gases from the immediate vicinity of the machine.

14.10.4 Should it be known or suspected that the refrigerant has leaked into any compartments, no attempt should be made to enter those compartments until a responsible officer has been advised of the situation. If it is necessary to enter the space, it should be ventilated to the fullest extent practicable and the personnel entering should wear approved breathing apparatus. A person should be stationed in constant attendance outside the space, also with breathing apparatus (see Chapter 16).

Chapter 15 - Permit to Work Systems

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to fishing vessels

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

15.1 Introduction

15.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter covers permits-to-work, which are suggested control measures for particular operations.

15.2 Permit-to-work systems

15.2.1 There are many types of operation on board ship where the routine actions of one person may inadvertently endanger another of when a series of action steps need to be taken to ensure the safety of those engaged in a specific operation. In all instances it is necessary, before the work is done, to identify the hazards and then to ensure that they are eliminated or effectively controlled. Ultimate responsibility rests with the employer to see that this is done.

15.2.2 The permit to work system consists of an organised and pre-defined safety procedure. A permit-to-work does not in itself make the job safe, but contributes to measures for safe working.

15.2.3 The particular circumstances of individual ships will determine when permit-to-work systems should be used. In using a permit-to- work, the following principles apply:

(a) the permit should be relevant and as accurate as possible. It should state the location and details of the work to be done, the nature and results of any preliminary tests undertaken, the measures undertaken to make the job safe and the safeguards that need to be taken during the operation;

(b) the permit should specify the period of its validity (which should not exceed 24 hours) and any time limits applicable to the work which it authorises;

(c) only the work specified on the permit should be undertaken;

(d) before signing the permit, the authorising officer should ensure that all measures specified as necessary have in fact been taken;

(e) the authorising officer retains responsibility for the work until he has either cancelled the permit or formally transferred it to another authorised person who should be made fully conversant with the situation. Anyone who takes over, either as a matter of routine or in an emergency, from the authorising officer, should sign the permit to indicate transfer of full responsibility;

(f) the person responsible for carrying out the specified work should countersign the permit to indicate his understanding of the safety precautions to be observed;

(g) on completion of the work, that person should notify the responsible officer and get the permit cancelled.

15.2.4 The annex to this Chapter gives examples of permits-to-work for various types of activity. The examples show the headings that may need to be covered. These should be adapted to the circumstances of the individual ship or the particular job to be carried out, in the light of the risk assessment.

ANNEX 15.1

SUGGESTED MINIMUM HEADINGS FOR INCLUSION IN PERMITS-TO-WORK

Separate permits may be developed for each of the types of activity below.

Note: The Authorising Officer should indicate the sections applicable by ticks in the left-hand boxes next to headings, deleting any sub-heading not applicable. He should insert the appropriate details when the Sections for Other Work or Additional precautions are used.

The Authorised Person should tick each applicable right-hand box as he makes his check.

Work to be done (description)

Location (designation of space, machinery etc.)

Authorised person in charge

Period of validity of permit (should not exceed 24 hours)

Crew details (names)

Authorising Officer

(signed) (time) (date)

Has a risk assessment of the proposed work been carried out?

	Entry into closed or confined space	
		Checked
1	Space thoroughly ventilated	1
2	Atmosphere tested and found safe	2
3	Space secured for entry	3
4	Rescue and resuscitation equipment available at entrance	4
5	Testing equipment available for regular checks	5
6	Responsible person in attendance at entrance	6
7	Communication arrangements made between person at entrance and those entering	7
8	Access and illumination adequate	8
9	All equipment to be used is of appropriate type	9
10	protective equipment to be used: Hard hat, safety harness as necessary	10
11	When breathing apparatus is being used: (i) Familiarity of user with apparatus is confirmed (ii) Apparatus has been tested and found to be satisfactory	 11(i) 11(ii)

	Machinery or equipment	
		Checked
1	Removed from service/isolated from sources of power or heat	1
2	All relevant personnel informed	2
3	Warning notices displayed	3

	Hot work	
		Checked
1	Area clear of dangerous material and gas-free	1
2	Adjacent areas checked	2
3	Ventilation adequate	3
4	Fire watchman posted/instructed	4
5	Equipment in good order	5
6	Fire appliances in good order and accessible	6
7	Personal protective equipment: Hard hats, overalls, leather gauntlets/apron, safety spectacles, visor etc.	7

	Working aloft/overside	
		Checked
1	Duty officer informed	1
2	Warning notices posted	2
3	On-deck supervisor identified	3
4	Equipment in good order	4

5	Work on funnel:- advise Duty engineer - isolate whistle, if appropriate	5
6	Work near Radar Scanners/Radio Aerials: isolate radar and scanner/radio room notified - notices placed to stop use of radar/radio	6
7	Work overside: - advise duty officer/engineer - lifebuoy and line ready	7
8	Personal protective equipment required: - safety helmet - safety harness and line attached to strong point - lifejacket	8
9	As necessary, all tools to be taken aloft secured by lanyard/bag/belt	9

	Work in unmanned machinery spaces	
		Checked
1	Permission from engineer officer in charge	1
2	Reporting procedures established and checked	2
3	Warning notices in place	3
4	Bridge notified	4
5	Machinery space adequately lit	5

	Other work	
		Checked
1		1
2		2
3		3
4		4

	Further control measures identified by the risk assessment	
		Checked
1		1
2		2
3		3
4		4

Certificate of checks:

I am satisfied that all precautions have been taken and that safety arrangements will be maintained for the duration of the work.

Authorised person in charge (Signed)

Cancellation of certificate:

The work has been completed/cancelled and all persons under my supervision, materials and equipment have been withdrawn.

Authorised person in charge (Signed) (time) (date)

Chapter 16 - Entering Enclosed or Confined Spaces

Application to fishing vessels which operate outside territorial waters
This chapter, except paragraphs 16.4.2 to 16.4.15 and 16.10, applies to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

16.1 Introduction

16.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights suggested control measures for entry into enclosed or confined spaces.

16.1.2 **The atmosphere of any enclosed or confined space is potentially dangerous.** The space may be deficient in oxygen and/or contain flammable or toxic fumes, gases or vapours. Where possible, alternative means of working which avoid entering the space should be found.

16.1.3 Should there be any unexpected reduction on or loss of the means of ventilation of those spaces that are usually continuously or adequately ventilated then such spaces should also be dealt with as dangerous spaces.

16.1.4 When it is suspected that there could be a deficiency of oxygen in any space, or that toxic gases, vapours or fumes could be present, then such a space should be considered to be a dangerous space.

16.2 Precautions on Entering Dangerous Enclosed or confined Spaces

16.2.1 The following precautions should be taken as appropriate before a potentially dangerous space is entered so as to make the space safe for entry without breathing apparatus and to ensure it remains safe whilst persons are within the space.

1. A competent person should make an assessment of the space and a responsible officer to take charge of the operation should be appointed – see 16.3;

2. the potential hazards should be identified – see 16.5;

3. the space should be prepared and secured for entry – see 16.5;

4. the atmosphere of the space should be tested – see 16.6;

5. **A "permit-to-work" system should be used –** see 16.7;

6. Procedures before and during the entry should be instituted – see 16.8 and 16.9.

16.2.2 Where the procedures listed at 1 to 4 in the previous paragraph have been followed and it has been established that the atmosphere in the space is or could be unsafe then the additional requirements including the use of breathing apparatus specified in 16.11 should also be followed.

16.2.3 No one should enter any dangerous space to attempt a rescue without taking suitable precautions for his own safety since not doing so would put his own life at risk and almost certainly prevent the person he intended to rescue being brought out alive.

16.3 Duties and Responsibilities of a Competent Person and of a Responsible Officer

16.3.1 A competent person is a person capable of making an informed assessment of the likelihood of a dangerous atmosphere being present or arising subsequently in the space. This person should have sufficient theoretical knowledge and practical experience of the hazards that might be met in order to be able to assess whether precautions are necessary. This assessment should include consideration of any potential hazards associated with the particular space to be entered. It should also take into consideration dangers from neighbouring or connected spaces as well as the work that has to be done within the space.

16.3.2 A responsible officer is a person appointed to take charge of every operation where entry into a dangerous space is necessary. This officer may be the same as the competent person (see 16.3.1 above) or another officer. Both the competent person and/or the responsible officer may be a shore-side person.

16.3.3 It is for the responsible officer to decide on the basis of the risk assessment the procedures to be followed for entry into a potentially dangerous space. These will depend on whether the assessment shows:

(a) there is a minimal risk to the life or health of a person entering the space then or at any future time;

(b) there is no immediate risk to health and life but a risk could arise during the course of work in the space; or

(c) the risk to life or health is immediate.

16.3.4 Where the assessment shows that there is no immediate risk to health or life but that a risk could arise during the course of the work in the space the precautions described in sections 16.4 to 16.9 should be taken as appropriate.

16.3.5 Where the risk to health or life is immediate then the additional requirements specified in section 16.11 are necessary.

16.3.6 For inland water vessels such as harbour craft either or both the competent person and the responsible officer may only be available from shore-based personnel. No entry into a potentially dangerous space should be made in these circumstances until such suitably qualified persons are available.

16.4 Identifying Potential Hazards

Oxygen Deficiency

16.4.1 If an empty tank or other confined space has been closed for a time the oxygen content may have been reduced owing to a number of reasons:

(a) rusting may have occurred due to oxygen combining with steel;

(b) oxygen absorbing chemicals may have been present;

(c) oxygen absorbing cargoes may have been carried or gases from volatile cargoes may have displaced the oxygen in tanks;

(d) hydrogen may have been produced in a cathodically-protected cargo tanks used for ballast;

(e) oxygen may have been displaced by the use of carbon dioxide or other fire-extinguishing or fire-preventing media, or inert gas in the tanks or inter-barrier spaces of tankers or gas carriers.

Toxicity of Oil Cargoes

16.4.2 Hydrocarbon gases are flammable as well as toxic and may be present in fuel or cargo tanks which have contained crude oil or its products.

16.4.3 Hydrocarbon gases or vapours may also be present in pump rooms and cofferdams, duct keels or other spaces adjacent to cargo tanks due to the leakage of cargo.

16.4.4 The components in the vapour of some oil cargoes, such as benzene and hydrogen sulphide are very toxic.

Toxicity of Other Substances

16.4.5 Cargoes carried in chemical tankers or gas carriers may be toxic.

16.4.6 There is the possibility of leakage from drums of chemicals or other packages of dangerous goods where there has been mishandling or incorrect stowage or damage due to heavy weather.

16.4.7 The trace of components in inert gas such as carbon monoxide, sulphur dioxide, nitric oxide and nitrogen dioxide are very toxic.

16.4.8 The interaction of vegetable or animal oils or sewage with sea water may lead to the release of hydrogen sulphide which is very toxic.

16.4.9 Hydrogen sulphide or other toxic gases may be generated where the residue of grain or similar cargoes permeates into or chokes bilge pumping systems.

16.4.10 The chemical cleaning, painting or the repair of tank coatings may involve the release of solvent vapours.

Flammability

16.4.11 Flammable vapours may still be present in cargo or other tanks that have contained oil products or chemical or gas cargoes.

16.4.12 Cofferdams and other spaces that are adjacent to cargo and other tanks may contain flammable vapours should there have been leakage into the space.

Other Hazards

16.4.13 Although the inhalation of contaminated air is the most likely route through which harmful substances enter the body, some chemicals can be absorbed through the skin.

16.4.14 Some of the cargoes carried in chemical tankers and gas carriers are irritant or corrosive if permitted to come into contact with the skin.

16.4.15 The disturbance of rust, scale or sludge residues of cargoes of animal, vegetable or mineral origin, or of water that could be covering such substances may lead to the release of toxic of flammable gases.

16.5 Preparing and Securing the Space for Entry

16.5.1 When opening the entrance to a potentially dangerous space, precautions should be taken in case pressurised or unpressurised vapour or gases are released from the space.

16.5.2 The space should be isolated and secured against the ingress of dangerous substances by blanking off pipelines or other openings and by closing valves. Valves should then be tied or some other means used to indicate that they are not to be opened and notices placed on the relevant controls. The officer on watch should be informed.

16.5.3 Where necessary, any sludge or other deposit liable to give off fumes should be cleaned out. This may in itself lead to the release of gases, and precautions should be taken (see 16.11).

16.5.4 The space should be thoroughly ventilated either by natural or mechanical means and then tested (see 16.6) to ensure that all harmful gases are removed and no pockets of oxygen deficient atmosphere remains.

16.5.5 Compressed oxygen should not be used to ventilate any space.

16.5.6 Where necessary pumping operations or cargo movements should be suspended when entry is being made into a dangerous space.

16.6 Testing the Atmosphere of the Space

16.6.1 Testing of a space should be carried out only by persons trained in the use of equipment.

16.6.2 Testing should be carried out before entry and at regular intervals thereafter.

16.6.3 If possible, the testing of the atmosphere before entry should be made by remote means. If this is not possible, the person selected to enter the space to test the atmosphere should only do so in accordance with the additional precautions specified in 16.11, which include the wearing of breathing apparatus.

16.6.4 Where appropriate, the testing of the space should be carried out at different levels.

16.6.5 Some monitoring equipment is designed for personal use purely to provide a warning against oxygen deficiency and hydrocarbon concentrations when there is a change in conditions. This should not be used as a means of determine whether a dangerous space is safe to enter.

Testing for Oxygen Deficiency

16.6.6 A steady reading of at least 20% oxygen by volume on an oxygen content meter should be obtained before entry is permitted.

16.6.7 A combustible gas indicator cannot be used to detect oxygen deficiency.

Testing for Flammable Gases and Vapours

16.6.8 The combustible gas indicator (sometimes called an exlosimeter) detect the amount of flammable gas or vapour in the air. An instrument capable of providing an accurate reading at low concentrations should be used to judge whether the atmosphere is safe for entry.

16.6.9 Combustible gas detectors are calibrated on a standard gas. When testing for other gases and vapours reference should be made to the calibration curves supplied with the instrument. Particular care is required should accumulations of hydrogen be suspected.

16.6.10 In deciding the atmosphere is safe to work in, a ‘nil’ reading on a suitably sensitive combustible gas indicator is desirable but, where the readings have been steady for some time, up to 1% or lower flammable limit may be accepted, e.g. for hydrocarbons in conjunction with an oxygen reading of at least 20% by volume.

16.6.11 Direct measurement of trace components of inert gas (see 16.4.7) is not required when the gas freeing of the atmosphere of a tank reduces the hydrocarbon concentration from about 2% by volume to 1% of lower flammable limit or less in conjunction with a

steady oxygen reading of at least 20% by volume, because this is sufficient to dilute the components to a safe concentration. If, before the commencement of gas freeing, the hydrocarbon concentration of a tank containing inert gas is below 2% by volume due to excessive purging by inert gas, then additional gas freeing is necessary to remove toxic products at the safe level without specialised equipment and trained personnel. If this equipment is not available for use, the period of gas freeing should be considerably extended.

Testing for Toxic Gases

16.6.11 The presence of certain gases and vapours on chemical tankers and gas carriers is detected by fixed or portable gas or vapour detection equipment. The readings obtained by this equipment should be compared with the occupational exposure limits for the contaminant given in international industry safety guides. These toxic substances which should not be exceeded if the health of the persons is to be protected. However, it is necessary to know for which chemical a test is being made in order to use the equipment correctly and it is important to note that not all chemicals may be tested by these means.

16.6.12 When a toxic chemical is encountered for which there is no means of testing then the additional requirements specified in 16.11 should also be followed.

16.6.13 A combustible gas indicator will probably not be suitable for measuring levels of gas at or around its occupational exposure limit, where there is solely a toxic, rather than a flammable, risk. This level will be much lower than the flammable limit, and the indicator will probably not be sufficiently sensitive to give accurate readings.

16.7 Use of control systems

16.7.1 Entry into a dangerous space should be planned in advance and use should preferably be made of a “permit-to-work” system. Details of the arrangements to be followed in a “permit-to-work” system are described in section 15.2. A sample “permit-to-work” is at Annex 1 of Chapter 15.

16.7.2 For situations for which a well established safe system of work exists a check-list may exceptionally be accepted as an alternative to a full “permit-to-work” provided that the principles of the “permit-to-work” system are covered and the risks arising in the dangerous space are low.

16.8 Procedures and Arrangement before Entry

16.8.1 Access to and within the space should be adequate and well illuminated.

16.8.2 No source of ignition should be taken or put into the space unless the master or responsible officer is satisfied that it is safe to do so.

16.8.3 In all cases rescue and available resuscitation equipment should be positioned ready for use at the entrance to the space. Rescue equipment means breathing apparatus together with fully charged spare cylinders of air, lifelines and rescue harnesses, and torches or lamp, approved for use in a flammable atmosphere, if appropriate. A means of hoisting an incapacitated person from the confined space may be required.

16.8.4 The number of personnel entering the space should be limited to those who actually need to work in the space. When necessary a rescue harness should be worn to facilitate recovery in the event of an accident.

16.8.5 At least one attendant should be instructed to remain at the entrance to the space whilst it is occupied.

16.8.6 An agreed and tested system of communication should be established between any person entering the space and the attendant at the entrance, and between the attendant at the entrance to the space and the officer on watch.

16.8.7 Before entry is permitted it should be established that entry with breathing apparatus is possible. Any difficulty of movement within any part of the space, or any problems if any incapacitated person had to be removed from the space, as a result of breathing apparatus or lifelines or rescue harnesses being used, should be considered and any risks minimised.

16.8.8 Lifelines should be long enough for the purpose and capable of being firmly attached to the harness, but the wearer should be able to detach them easily should they become tangled.

16.9 Procedures and Arrangements During entry

16.9.1 Ventilation should continue during the period that the space is occupied and during temporary breaks. In the event of a failure of the ventilation system any personnel in the space should leave immediately.

16.9.2 The atmosphere should be tested periodically whilst the space is occupied and personnel should be instructed to leave the space should there be any deterioration of the conditions.

16.9.3 If unforeseen difficulties or hazards develop, the work in the space should be stopped and the space evacuated so that the situation can be re-assessed. Permits should be withdrawn and only re-issued, with any appropriate revisions, after the situation has been re-assessed.

16.9.4 If any personnel in a space feel in any way adversely affected they should give the pre-arranged signal to the attendant standing by the entrance and immediately leave the space.

16.9.5 Should an emergency occur the general (or crew) alarm should be sounded so that back-up is immediately available to the rescue team. Under no circumstances should the attendant enter the space before help has arrived and the situation has been evaluated to ensure the safety of those entering the space to undertake the rescue.

16.9.6 If air is being supplied through an air line to the person who is unwell, a check should be made immediately that the air supply is being maintained at the correct pressure.

16.9.7 Once the casualty is reached, the checking of the air supply must be the first priority. Unless he is gravely injured, e.g. a broken back, he should be removed from the dangerous space as quickly as possible.

16.10 Procedures on completion

16.10.1 On expiry of the "permit-to-work", everyone should leave the space and the entrance to the space should be closed or otherwise secured against entry or alternatively, where the space is no longer a dangerous space, declared safe for normal entry.

16.11 Additional Requirements for Entry into a Space where the Atmosphere is suspect or known to be Unsafe

16.11.1 If the atmosphere is considered to be suspect or unsafe to enter, the space should only be entered if it is essential for testing purposes, for the safety of life or of the ship, or for the working of the ship. Breathing apparatus should always be worn (see 16.13). The number of persons entering the space should be the minimum required by the work to be performed.

16.11.2 Except in the case of an emergency, or where impracticable because movement in the space would be seriously impeded, two air supplies as described in 16.13.2 should be available.While working the wearer should use the continuous supply provided from outside the space. If it becomes necessary to change over to the self-contained supply, the user should immediately exit from the space.

16.11.3 Precautions should be taken against any disruption to the air supply while the individual is inside the enclosed space. Special attention should be given to supplies originating from the engine room.

16.11.4 Where remote testing of the space (as recommended in 16.6.3) is not reasonably practicable, or where a brief inspection only is required, a single air supply may be acceptable provided that the wearer of breathing apparatus is so situated that he can be hauled out immediately in the case of an emergency.

16.11.5 In addition to rescue harnesses, wherever practicable lifelines should be used. Lifelines should be attended by a person stationed at the entrance who has been trained in how to pull an unconscious person from a dangerous space. If hoisting equipment would be required for any rescue, arrangements should be made to ensure that personnel would be available to operate it as soon as necessary.

16.11.6 When appropriate, portable lights and other electrical equipment should be of a type approved for use in a flammable atmosphere.

16.11.7 Should there be any hazard due to chemicals, whether in liquid, gaseous or vapour form, coming into contact with the skin and/or eyes then protective clothing should be worn.

16.12 Training, Instruction and Information

16.12.1 Employers should provide any necessary training, instruction and information. This should include:

1. recognition of the circumstances and activities likely to lead to the presence of a dangerous atmosphere;

2. the hazards associated with entry into dangerous spaces, and the precautions to be taken;

3. the use and maintenance of equipment and clothing required for entry into dangerous spaces;

4. instruction and drills in rescue from dangerous spaces.

16.13 Breathing Apparatus and Resuscitation Equipment

16.13.1 No one should enter a space where the atmosphere is unsafe or suspect without wearing breathing apparatus which they are trained to use, even to rescue another person.

16.13.2 Breathing apparatus for those working in a dangerous space will usually comprise a continuous supply from outside the space and a self-contained supply to enable the wearer to escape to a safe atmosphere in the event of difficulty with, or failure of, the continuous supply. It should not be necessary to remove any part of the equipment or any protective clothing to change over to the self-contained supply.

16.13.3 Equipment for use with two air supplies may consist of:

(a) A conventional self-contained breathing apparatus of the open circuit compressed air type that is as per CYS EN 137: 1993 standard (see Appendix 1) and has been additionally tested for use with an air line connections; or

(b) a compressed air line breathing apparatus incorporating an emergency self-contained supply. The compresses air line breathing apparatus should be of the demand valve type and should be as per CYS EN 139: 1995 standard (see Appendix 1) or for self-rescue purposes (see Annex 1 relevant standard).

The capacity of the self-contained supply should be sufficient for the wearer to escape to a safe atmosphere. When determining this capacity it should be recognised that, under stress or in difficult conditions, the wearer's breathing rate may be in excess of the nominal breathing rate of 40 litre per minute.

16.13.4 The responsible officer should make sure that the supply of air from outside the space is continuous and is available only to those working in the space. Pipeline or hoses supplying air should be placed so that they are not likely to be so distorted that supply might be interrupted or damaged. If the purpose for which such air lines are used is not immediately apparent to personnel engaged in the entry, then notices should be posted at appropriate positions. Where a mechanical pump is being used it should be frequently checked carefully to ensure that it continues to operate properly. Any air pumped directly into a pipeline or put into reserve bottles must be filtered and should be as fresh as

possible. Pipelines or hoses used to supply air should be thoroughly blown through to remove moisture and is essential that where the air supply is from a compressor sited in a machinery space, the engineer of the watch informed so that the compressor is not shut-down until the work is completed.

16.13.5 Everyone likely to use breathing apparatus must be instructed by a competent person in its proper use.

16.13.6 The master, or responsible officer, and the person about to enter the space should undertake the full pre-wearing check and donning procedures recommended in the manufacturer's instructions. In particular they should check:

1. that there will be sufficient clean air at the correct pressure;

2. that low pressure alarms are working properly;

3. that the facemask fits correctly against the user's face so that, combined with pressure of the air coming into the mask, there will not be an ingress of oxygen deficient air or toxic vapours when the user inhales. It should be noted that facial hair or spectacles may prevent the formation of an air-tight seal between a person's face and the facemask;

4. that the wearer of the breathing apparatus understands whether or not their air supply may be shared with another person and if so is also aware that such procedures should only be used in an extreme emergency;

5. that when work is being undertaken in the space the wearer should keep the self-contained supply for use when there is a failure of the continuous supply from outside the space.

16.13.7 When in a dangerous space:

1. no one should remove their own breathing apparatus;

2. breathing apparatus should not be removed from a person unless it is necessary to save their life.

16.13.8 It is recommended that resuscitators of an appropriate kind should be provided where any person may be required to enter a dangerous space. Where entry is expected to occur at sea the ship should be provided with appropriate equipment. Otherwise entry should be deferred until the ship has docked and use can be made of shore side equipment.

Maintenance of Equipment for entry into dangerous spaces

16.13.9 All breathing apparatus, rescue harnesses, lifelines, resuscitation equipment and any other equipment provided for use in, or in connection with, entry into dangerous spaces, or for use in emergencies, should be properly maintained, inspected periodically and checked for correct operation by a competent person and a record of the inspections

and checks should be kept. All items of breathing apparatus should be inspected for correct operation before and after use.

16.13.10 Equipment for testing the atmosphere of dangerous space, including oxygen meters, should be kept in good working order and, where applicable, regularly serviced and calibrated. Due regard should be paid to manufacturers' recommendations which should always be kept with the equipment.

Chapter 17 - Boarding Arrangements

Application to fishing vessels which operate outside territorial waters
This Chapter, except paragraph 17.8 and the Annexes, applies to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

17.1 Introduction

17.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of boarding arrangements.

17.2 Positioning of Boarding Equipment

17.2.1 The angles of inclination of a gangway or accommodation ladder should be kept within the limits for which it was designed. Gangways should not be used at an angle of inclination greater than 30º from the horizontal and accommodation ladders should not be used at an angle greater that 55º from the horizontal, unless specifically designed for greater angles.

17.2.2 When the inboard end of the gangway or accommodation ladder rests on or is flush with the top of the bulwark, a bulwark ladder should be provided. Any gap between the bulwark ladder and the gangway or accommodation ladder should be adequately fenced to a height of at least 1 metre.

17.2.3 Gangways and other access equipment should not be rigged on ship's rails unless the rail has been reinforced for that purpose. They should comply with the guidance in Annex 17.1.

17.2.4 The means of access should be checked to ensure that it is safe to use after rigging. There should be further checks to ensure that adjustments are made when necessary due to tidal movements or change of trim and freeboard. Guard ropes, chains etc. should be kept taut at all times and stanchions should be rigidly secured.

17.2.5 Each end of a gangway or accommodation or other ladder should provide safe access to a safe place or to an auxiliary safe access.

17.2.6 The means of access should be sited clear of the cargo working area and so placed that no suspended load passes over it. Where this is not practicable, access should be supervised at all times.

17.2.7 A lifebuoy should be available and ready for use at the point of access aboard the ship.

17.3 Lighting and Safety of Movement

17.3.1 In normal circumstances, the boarding equipment and the immediate approaches to it should be effectively illuminated from the ship or the shore to at least a level of 20 lux, as measured at a height of 1 metre above the surface of the means of access or its immediate approaches. Where the dangers of tripping or falling are greater than usual because of bad weather conditions or where the means of access are obscured, e.g. by the presence of coal dust, consideration should be given to a higher minimum level of say 30 lux.

17.3.2 The means of boarding and its immediate approaches should be kept free from obstruction and, as far as is reasonably practicable, kept clear of any substance likely to cause a person to slip or fall. Where this is not possible, appropriate warning notices should be posted and if necessary the surfaces suitably treated.

17.4 Portable and Rope Ladders

17.4.1 Where, exceptionally, a portable ladder is used for the purpose of access to the ship, it is very important that the ladder is checked regularly by a competent person, and that account is taken of vessel movement and tide changes.

17.4.2 When it is necessary to use a portable ladder for access it should be used at an angle of between 60º and 75º from the horizontal. The ladder should extend at least 1 metre above the upper landing place unless there are other suitable handholds. It should be properly secured against slipping or shifting sideways or falling and be so placed as to afford a clearance of at least 150 mm behind the rungs.

17.4.3 When a portable ladder is resting against a bulwark or rails, suitable safe access to the deck as recommended in paragraph 17.2.2 should be provided.

17.4.4 A rope ladder should never be secured to rails or to any other means of support unless the rails or support are so constructed and fixed as to take the weight of a man and a ladder with an ample margin of safety.

17.4.5 A rope ladder should be left in such a way that it either hangs fully extended from a securing point or is pulled up completely. It should not be left so that any slack will suddenly pay out when the ladder is used.

17.4.6 Where the freeboard is 9 metres or more, a rope ladder should be used in conjunction with an accommodation ladder, leading aft and positioned in such a way as to provide safe and easy access from the rope ladder to the bottom platform. Further guidance is contained in Annex 17.1.

17.5 Safety nets

17.5.1 A safety net should be mounted whenever possible where a person may fall from boarding equipment or from the ship's deck or quayside. The aim of safety nets is to minimize the risk of injury arising from falling between the ship and the quay, of falling onto the quay or deck and as far as is reasonably practicable the whole length of the means of access should be covered. Safety nets should be securely rigged, with use being made of attachment points on the quayside where appropriate.

17.6 Maintenance of equipment for means of access

17.6.1 Any equipment used for boarding must be properly maintained, and should be inspected by a competent person at appropriate intervals. Any defects affecting the safety of any access equipment, including access provided by a shore authority, should be reported immediately to a responsible person and should be made good before further use.

17.6.2 Aluminium equipment should be examined for corrosion in accordance with the instructions in Annex 17.2

17.7 Special Circumstances

17.7.1 In some circumstances it may not be practical to mount proper safe boarding arrangements by conventional means, for example, where there is frequent movement of the ship during cargo operations. On such occasions boarding should be carefully supervised and consideration given to providing alternative means of access.

17.7.2 Small boats or tenders used between the shore and the ship should be safe and stable, be suitably powered, correctly operated and properly equipped with the necessary safety equipment and, if not a ship's boat, be approved for that purpose.

17.7.3 Where a vessel is moored alongside another vessel, there should be co-operation between the two vessels in order to provide suitable and safe boarding arrangements. Access should generally be provided by the ship lying outboard, except that, where there is a great disparity in freeboard, access should be provided by the ship with the higher freeboard.

17.7.4 Care should be taken at all times, but particularly at night, when boarding or leaving a ship, or when moving through the dock area. The edges of the docks, quay etc. should be avoided and any sign prohibiting entry to an area should be strictly observed. Where there are designated routes they should be followed exactly. This is particularly important in the vicinity of container terminals or other areas where rail traffic, straddle carrier or other mechanical handling equipment is operating, as the operators of such equipment have restricted visibility, placing anyone walking within the working area at risk.

17.7.5 Transfer of personnel between two unsecured ships at sea is potentially a particularly dangerous manoeuvre. A risk assessment of the transfer arrangements should be undertaken and appropriate safety measures put into place to ensure the safety of those involved. Both vessels should be properly equipped and/or modified to allow the

boarding to be undertaken without unnecessary risk. A proper embarkation point should be provided, and the boarding procedure clearly agreed. The relative movements of both vessels in any seaway and varying sea, tide and swell conditions make the judgement of when to effect a transfer crucial. The master responsible for the transfer operation should have full sight of the area of transfer and he, and at least one designated crew member should be able to communicate at all times with the crew member making the transfer. It is recommended that vessels undertaking ship to ship transfers while underway, should carry equipment designed to aid in the rapid recovery of a casualty from the waters.

17.8 Pilot ladders and hoists

17.8.1 Where a pilot hoist is provided, personnel engaged in rigging and operating it should be fully instructed in the safe procedures to be adopted and the equipment should be tested prior to use.

17.8.2 The pilot ladder and any accommodation ladder used in conjunction with it should conform to the standards contained in Annex 17.1.

17.8.3 In addition to the general points in sections 17.2 to 17.4 above, in order to minimised the danger to pilots when boarding and leaving ships, particular attention should be given to the following points:

(a) pilot ladders should be rigged in such a manner that the steps are horizontal, and such that the lower end is at a height above the water to allow ease of access to and from the attendant craft;

(b) the ladder should rest firmly against the side of the ship;

(c) when an accommodation ladder is used in conjunction with a pilot ladder, the pilot ladder should extend at least two metres above the bottom platform;

(d) the rigging of pilot ladders and the embarkation and disembarkation of pilots must be supervised by a responsible officer of the ship, who should be in contact with the bridge;

(e) a lifebuoy with self-igniting light should be kept available at the point of access to the ship;

(f) at night, the pilot ladder and ship’s deck should be lit by a forward-shining, over side light.

17.8.4 It is very important that the ship offers a proper lee to the pilot boat. The arrangements for boarding should preferably be sited as near amidships as possible, but in no circumstances should they be in a position which could lead to the pilot boat running the risk of passing underneath overhanging parts of the ship’s hull structure.

ANNEX 17.1

CONSTRUCTION OF MEANS OF ACCESS

General

1. Gangways must be carried on ships of 30 metres in length or over and accommodation ladders must be carried on ships of 110 metres in length or over, complying with the specifications below. Access equipment must be of good construction, sound material and adequate strength, free from patent defect and properly maintained. Rope ladders must comply with the requirements in Section 17.4 and paragraph 7 below.

2. Gangways and accommodation ladders must be clearly marked with the manufacturer's name, the model number, the maximum designed angle of use and the maximum safe loading both by numbers of persons and by total weight.

3. Gangways must comply with the specifications set out in ISO 7061: 1979 standard (see appendix 1), and must be fitted with suitable fencing along their entire length.

Accommodation ladders

4. Accommodation ladders must comply with the specifications set out in ISO 5488: 1979 standard (see appendix 1).

5. The ladder should be designed so that:

   it rests firmly against the side of the ship;

   the angle of slope is no more than 55º. Treads and steps should provide a safe foothold at the angle at which the ladder is used;

   it is fitted with suitable fencing (preferably rigid handrails) along its entire length, except that fencing at the bottom platform may allow access from the outboard side;

   the bottom platform is horizontal, and any intermediate platforms are self-levelling.

6. When a bulwark ladder is to be used it must comply with the specifications set out in BS MA 39:Part 2 1973 standard (see appendix 1). Adequate fittings must be provided to enable the bulwark ladder to be properly and safely secured.

Rope Ladders

A rope ladder must be of adequate width and length and so constructed that it can be efficiently secured to the ship.

the steps must provide a slip-resistant foothold of not less that 400 mm x 115 mm x 25 mm and must be so secured that they are firmly held against twist, turnover or tilt.

the steps must be horizontal and equally spaced at intervals of 310 mm (± 5 mm)

the side ropes, which should be a minimum of 17 mm in diameter, should be equally spaced;

there should be no shackles, knots or splices between rungs;

ladders of more than 1.5 metres in length must be fitted with spreaders not less than 1.8 metres long. The lowest spreader must be on the fifth step from the bottom and the interval between spreaders must not exceed nine steps. The spreaders should not be lashed between steps.

Access for Pilots

8. In addition to the standards above, every pilot ladder should be positioned and secured so that:

    it is clear of any possible discharges from the ship;

    it is, where practicable, within the mid-ship half-section of the ship (but see 17.8.4);

    it is firmly secured to the ship's side; and

    the person climbing it can safely and conveniently board the ship after climbing no more than 9 metres.

9. Where replacement steps are fitted, they should be secured in position by the method used in the original construction of the ladder. No pilot ladder should have more than two replacement steps secured in position by a different method. Where a replacement step is secured by means of grooves in the sides of the step, such grooves should be in the longer sides of the step.

10. Two man-ropes of not less than 28 mm in diameter, properly secured to the ship should be provided.

11. Safe, convenient and unobstructed access should be provided to anyone embarking or disembarking between the ship and the head of the pilot ladder.

12. Where access to the ship is by gateway in the rails or bulkhead, adequate handholds should be provided. Shipside doors used for this purpose should not open outwards.

13. Where access is by bulwark ladder, the ladder should be securely attached to the bulwark rail or landing platform. Two handhold stanchions should be provided, between 700 mm and 800 mm apart, each of which should be rigidly secured to the ship's structure at or near its base and at another higher point. The stanchions should be at least 40 mm in diameter and extend no less than 1.20 metres above the top of the bulwarks.

14. Where the freeboard of the ship is more than 9 metres, accommodation ladders must be provided on each side of the ship.

15. Such accommodation ladders should comply with the standards in paragraph 5 above, and in addition:

the pilot ladder should extend at least 2 metres above the accommodation ladder's bottom platform;

If a trap door is fitted in the bottom platform to allow access to the pilot ladder, the opening should be no less than 750 mm square, and the after part of the bottom platform should be fenced as the rest of the ladder. In this case, the pilot ladder should extend above the lower platform to the height of the handrail.

Pilot hoists

16. Detailed construction standards for pilot hoists are contained in SOLAS Chapter V/23. These have not been re-produced here as hoists must be of an approved design and are subject to annual survey as part of the annual and renewal survey for the vessel's safety equipment certificate.

ANNEX 17.2

CORROSION OF ACCOMMODATION LADDERS AND GANGWAYS

1. Aluminium alloys are highly susceptible to galvanic corrosion in a marine atmosphere if they are used in association with dissimilar metals. Great care should be exercised when connecting mild steel fittings, whether or not they are galvanised, to accommodation ladders and gangways constructed of aluminium.

2. Plugs and joints of neoprene, or other suitable material, should be used between mild steel fittings, washers, etc. and aluminium. The plugs or joints should be significantly larger than the fittings or washers.

3. Repairs using mild steel doublers or bolts made of mild steel or brass or other unsuitable material should be considered as temporary. Permanent repairs, or the replacement of the means of access, should be undertaken at the earliest opportunity.

4. The manufacturers' instructions should give guidance on examination and testing of the equipment. However, close examination of certain parts of accommodation ladders and gangways is difficult due to their fittings and attachments. It is essential, therefore, that the fittings are removed periodically for a thorough examination of the parts most likely to be affected by corrosion. Accommodation ladders and gangways should be turned over to allow for a thorough examination of the underside. Particular attention should be paid to the immediate perimeter of the fittings; this area should be tested for corrosion with a wire probe or scribe. Where the corrosion appears to have reduced the thickness of the parent metal to 3 mm, back plates should be fitted inside the stringers of the accommodation ladder or gangways.

Chapter 18 - Manual Handling

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

18.1 Introduction

18.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of manual handling.

18.1.2 The assessment should take full account not only of the characteristics of the load and the physical effort required but also of the working environment (e.g. ship movement, confined space, high or low temperature, physical obstacles such as steps or gangways) and any other relevant factors (e.g. the age and health of the person, the frequency and duration of the work). A fuller list of factors to be considered is given in Annex 18.1.

18.2 General

18.2.1 The term “manual handling” is used to describe any operation which includes any transporting or supporting of a load, lifting, putting down, pushing, pulling, carrying or moving by hand or by bodily force. This guidance is generally concerned with preventing musculo-skeletal injury.

18.2.2 There may of course be other hazards to those handling loads, for example from leakage of a hazardous substance from a package being moved, but these are dealt with in other relevant Chapters.

18.2.3 Musculo-skeletal injuries can occur as a result of accident, poor organisation or an unsatisfactory working method.

18.3 Role of Employers

18.3.1 So far as reasonably practicable, the employer must take appropriate measures or provide the means to avoid the need for any manual handling operations which may cause injury to workers, for example by re-organisation of the work, or automating or mechanising the operation. Before instructing personnel to lift or carry by hand where there is a risk of injury, employers should consider whether alternative means of doing the same job would reduce the risk of injury.

18.3.2 Where there is no practical alternative to manual handling, the employer must:

(a) Carry out an assessment of the manual handling operations, taking into account the factors and questions in Annex 18.1.;

(b) take appropriate steps to reduce the risk of injury;

(c) provide workers with general indications, and where it is available, precise information on:

- the weight of each load;

- where the centre of gravity of any load is not positioned centrally, the heaviest side of the load;

(d) provide workers with proper training and information on how to handle loads correctly and the risks to their health and safety from incorrect handling.

18.3.3 Means of reducing the risk of injury may include:

re-organisation of work stations (to enable workers to maintain good posture while lifting and carrying); and

taking account of an individual's capabilities when allocating tasks.

There are often severe limitations in a ship on the improvements that can be made, but the employer should ensure that, as far as reasonably practicable, risks have been minimised.

18.3.4 Instruction for personnel may involve experienced and properly trained personnel demonstrating best practice especially to new recruits.

18.4 Advice to seafarers

18.4.1 Workers must make full and proper use of any system of work provided by the employer.

18.4.2 Personnel should:

use any mechanical aids provided;

follow instructions; and

take sensible precautions to ensure that they are aware of any risk of injury from the load before picking it up.

18.4.3 In manual lifting and carrying, the proper procedure to be followed is:

assess the load to be lifted, taking account of any information provided by the employer;

look for sharp edges, protruding nails or splinters, for surfaces which are greasy or otherwise difficult to grip and for any other features which may prove awkward or dangerous – for example sacks of ship's stores may be difficult to get off the deck;

ensure that the deck or area over which the load is to be moved is free from obstructions and not slippery.

18.4.4 The diagram (Annex 18.2 Fig 1) illustrates some important points in lifting techniques.

(a) a firm and balanced stance should be taken close to the load with the feet a little apart, not too wide, so that the lift will be as straight as possible;

(b) a crouching position should be adopted, knees bent and maintaining the natural curve of the back to ensure that the legs do the work. It helps to tuck in the chin while gripping the load and then raise the chin as the lift begins;

(c) the load should be gripped with the whole of the hand – not fingers only. If there is insufficient room under a heavy load to do this a piece of wood should be put underneath first;

(d) the size and shape of the load are not good guides to its weight or weight distribution. If this information is not available a careful trial lift should be made, and if there is any doubt whether the load can be managed by one person help should be provided;

(e) the load should be lifted by straightening the legs, keeping it close to the body. The heaviest side should be kept closest to the trunk. The body should not be twisted as this will impose undue strain on the back and other parts of the body;

(f) if the lift is to a high level, it may be necessary to do it in two stages; first raising the load onto a bench or other support and then completing the lift to the full height, using a fresh grip (Fig. 2).

18.4.5 When two or more people are handling a load, it is preferable that they should be of similar stature. The actions of lifting, lowering and carrying should, as far as possible, be carried out in unison to prevent strain and any tendency for either person to overbalance (Fig. 3).

18.4.6 The procedure for putting a load down is the reverse of that for lifting, the legs should do the work of lowering – knees bent, back straight and the load close to the body. Care should be taken not to trap fingers. The load should not be put down in a position where it is unstable. If precise positioning is necessary, the load should be put down first, then slid into the desired position.

18.4.7 A load should always be carried in such a way that it does not obscure vision, so allowing any obstruction to be seen.

18.4.8 The risk of injury may be reduced if lifting can be replaced by controlled pushing or pulling. For example, it may be possible to slide the load or roll it along. However, uncontrolled sliding or rolling, particularly of large or heavy loads, may introduce fresh risks of injury.

18.4.9 For pulling and pushing, a secure footing should be ensured, and the hands applied to the load at a height between waist and shoulder wherever possible (Fig. 4). A further option, where other safety considerations allow, is to push with the worker's back against the load, using the strong leg muscles to exert the force (Fig. 5).

18.4.10 Suitable shoes or boots should be worn for the job. Protective toecaps help to guard toes from crushing if the load slips; they can sometimes also be useful when putting the load down to take the weight while hands are removed from underneath.

18.4.11 Clothing should be worn which does not catch in the load and which gives some body protection.

18.4.12 Where the work is very strenuous, for example due to load weight, repetitive effort over a period or environmental factors, such as a confined space or an extreme of temperature, rest should be taken at suitable intervals, to allow muscles, heart and lungs to recover; fatigue makes accidents more likely on work of this type.

18.4.13 Whenever possible, manual lifting and carrying should be organised in such a way that each person has some control over their own rate of work.

ANNEX 18.1

FACTORS TO BE CONSIDERED

The following are examples of the factors to which the employer should have regard and questions he should consider when making an assessment of manual handling operations or providing instruction for personnel.

Plain text gives the general factors and questions to be considered in the risk assessment carried out under the regulations.

Additonal specific factors which may be found on board ship are included for guidance.

Factors	Questions
1 The tasks	**Do they involve:**
	- activity which is too strenuous?
	- holding or manipulating loads at distance - from trunk?
	- unsatisfactory or unstable bodily movement or postures, especially: twisting the trunk? stooping? reaching upward?
	- excessive movement of loads, especially:
	excessive lifting or lowering distances?

excessive carrying distances?

- risk of sudden movement of loads?

- frequent or prolonged physical effort, particularly affecting the spine?

- insufficient rest or recovery periods?

- a rate or work imposed by a process?

- climbing up or down stairs?

- handling while seated?

- use of special equipment?

- team handling?

2 The loads **Are they:**

- heavy?

- bulky or unwieldy, or difficult to grasp?

- unstable, or with contents likely to shift?

- likely, because of the contours and/or consistency, to injure workers, particularly if the individual collides with someone or something?

- wet, slippery, very cold or hot and therefore difficult to hold?

- sharp?

- potentially damaging/dangerous if dropped?

3 The working environment **Are there:**

- space constraints preventing handling loads at a safe height or with good posture?

- uneven, slippery or unstable deck surface?

- variations in level of deck surfaces (e.g. door sills) or work surfaces?

- extremes of temperature or humidity?

- has account been taken of the sea- state, wind speed and the unpredictable movement of the deck?

- are there steps, stairs or ladders or self-closing doors to be negotiated?

- is the area adequately lit?

- is movement or posture hindered by personal protective equipment or by clothing?

4 Individual capability **Is the individual**

- physically unsuited to carry out the task, either because of the nature of the tasks or because of a need to protect an individual from a danger which specifically affects him? i.e. does the job require unusual strength, height etc.? Is there a hazard to those who might reasonably be considered unsuited to the task? Does it pose a risk to those who are pregnant or have a health problem?

- wearing unsuitable clothing, footwear or other personal effects?

- inadequately experienced or trained?

- inadequately equipped?

Annex 18.2
Graphic illustrations of manual handling techniques

fig1

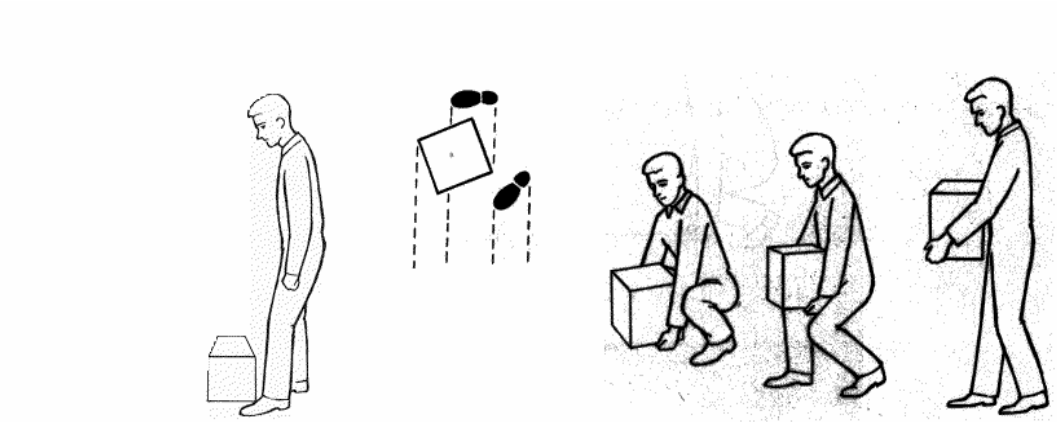
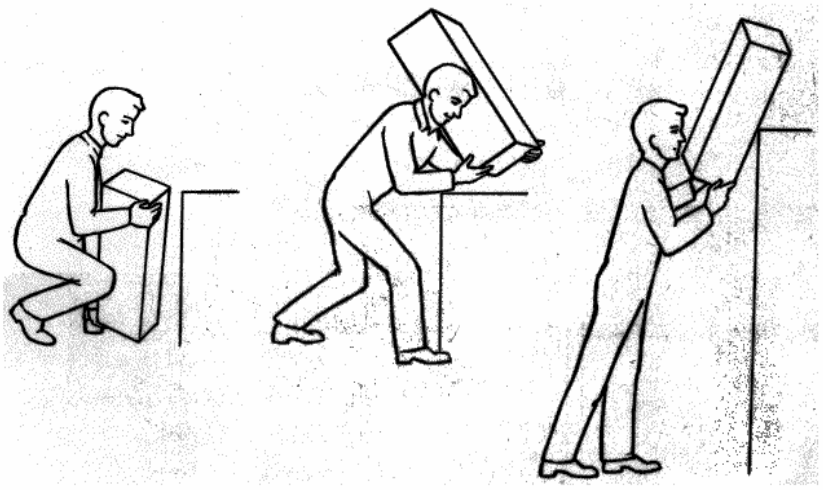


fig 2



Graphic illustrations of manual handling techniques (continued)

fig3

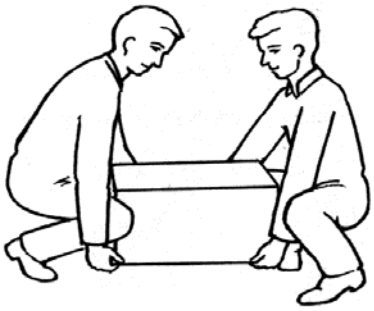


fig 4

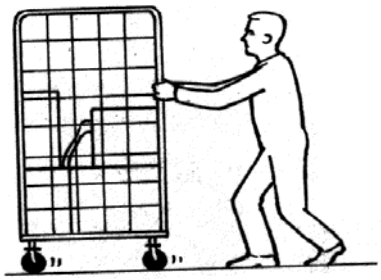
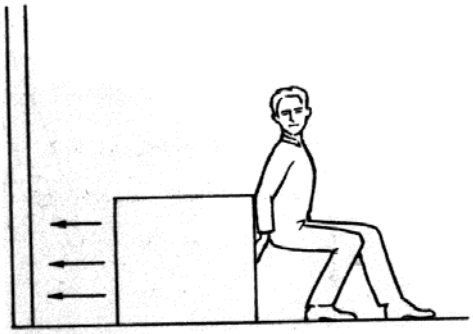


fig 5



Chapter 19 – Use of work equipment

Application to fishing vessels which operate outside territorial waters
This Chapter, except 19.12 and 19.13, applies to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

19.1 Introduction

19.1.1 Based on the findings of the risk assessment appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of use of work equipment.

19.2 Use of tools and equipment

19.2.1 This section gives general advice which is applicable to all kinds of equipment including both powered and hand tools. Some types of equipment which pose particular risks are covered by later sections. Lifting equipment which pose particular risks are covered by later sections. Lifting equipment, because of the serious hazards it presents, is dealt with in more detail in Chapter 20.

19.2.2 Tools should be used only for the purpose for which they were designed. Personnel should ensure that they use the correct tools or equipment for a task. Use of unsuitable tools or equipment may lead to accidents.

19.2.3 Loose clothing or jewellery should never be worn while using machinery, as there is a risk that it may become caught in moving parts. For the same reason, long hair should always be tied back and covered with a hair net or safety cap.

19.2.4 Only those competent to use equipment should do so. New recruits should always be shown how to use any equipment which may injure them or another person if it is carelessly or incorrectly handled or used.

19.2.5 Incorrect use of tools and equipment can cause accidents, as well as damage to the equipment in question. Instructions for use should always be consulted and followed, where they are available.

19.2.6 When not in use equipment should be stowed in a tidy and correct manner. Any cutting edges should be protected.

19.3 Hand tools

19.3.1 Damaged or worn tools should not be used, and cutting edges should be kept sharp and clean. Repair and dressing of tools should be carried out by a competent person.

19.3.2 Wherever practicable, a tool in use should be directed away from the body, so that if it slips it does not cause injury. However when using a spanner more control is gained by pulling towards the body. When using a tool with a cutting edge, both hands should be kept behind the blade.

19.3.3 A chisel is best held between thumb and base of index finger with thumb and fingers straight, palm of hand facing towards the hammer blow.

19.3.4 A saw should not be forced, it should be pushed with a light, even movement.

19.4 Portable power operated tools and equipment

19.4.1 **Power operated equipment may be dangerous unless:** properly maintained, handled and used and should only be used by competent persons. The flexible cables of electric tools should comply with BS 6500:1990 standard (see appendix 1). Before work begins, personnel should ensure that power supply leads and hoses are in good condition, laid safely clear of all potentially damaging obstructions and do not obstruct safe passage. Where they pass through doorways, the doors should be secured open.

19.4.2 The risk of electric shock is increased either by perspiration or in locations which are damp, humid or have large conductive surfaces. In such conditions power tools should be operated from low voltage supplies (no more than 50 volts AC with a maximum of 30 volts to earth of 50 volts DC).

19.4.3 Where it is not practicable to use low voltages, other precautions such as a local isolating transformer supplying one appliance only or a high sensitivity earth leakage circuit breaker (also known as a residual current device) should be used.

19.4.4 The risk associated with portable electric tools also applies to portable electric lamps. The supply to these should not exceed 24 volts.

19.4.5 Double insulated tools are not recommended for use on ships because water can provide a contact between live parts and the casing, increasing the risk of fatal shock.

19.4.6 Chain linkages or similar devices should be fitted between sections of pneumatic hose to prevent whip-lash in the event of breakage. Alternatively, safety valves can be used which close off the lines.

19.4.7 Accessories and tool pieces (drill bit, chisel etc.) should be absolutely secure in the tool. In particular, retaining springs, clamps, locking levers and other built-in safety devices on pneumatic tools should be replaced after the tool piece is changed. Accessories and tool pieces should not be changed while the tool is connected to a source of power.

19.4.8 Correct safety guards for appliances should be securely fixed before starting any operation. They should only be removed when the machinery is not operating. However, if removal is essential for maintenance or examination of the equipment, the following precautions should be taken:

removal should be authorised by a responsible person, and only a competent person should carry out the work or examination;

there should be adequate clear space and lighting for the work to be done;

anyone working close to the machinery should be told what the risks are and instructed in a safe system of work and precautions to take;

a warning notice should be conspicuously posted.

19.4.9 During temporary interruptions to work e.g. meal breaks and also at completion of a task, equipment should be isolated from power sources and left safely or stowed away correctly.

19.4.10 Where the work operation causes high noise levels, hearing protection should be worn. Where flying particles may be produced, the face and eyes should be protected (see Chapter 4 Personal Protective Equipment).

19.4.11 The vibration caused by reciprocating tools (pneumatic drills, hammers, chisels etc.) or high speed rotating tools can give rise to a permanent disablement of the hands known as “dead” or “white” fingers. In its initial stages, this appears as a numbness of the fingers and an increasing sensitivity to cold, but in more advanced stages, the hands become blue and the fingertips swollen. Those prone to the disability should not use such equipment. Others should be advised not to use them for more than 30 minutes without a break.

19.4.12 Emergency stops switches must be installed where necessary.

19.5 Workshop and Bench Machines (Fixed installations)

19.5.1 Fixed installations should only be operated by competent personnel. The operator should check a machine every time before use, and ensure that all safety guards and devices are in position and operative, that all tool pieces (drill bits, cutting blades, etc.) are in good condition, and that the work area is adequately lit and free from clutter.

19.5.2 No machine should be used when a guard or safety device is missing, incorrectly adjusted or defective or when it is itself in any way faulty (see also advice in 19.4.8 above). If any defect is identified, the machine should be isolated from its source of power until it has been repaired.

19.5.3 During operations, personnel should ensure that work pieces are correctly secured in position, machine residues (swarf, sandings etc.) do not build up excessively, and are disposed of in a correct and safe manner.

19.5.4 Whenever machinery is left unattended, even if only briefly, the power supply should be switched off and isolated, and the machinery and any safety guards should be rechecked before resuming work.

19.6 Abrasive wheels

19.6.1 Abrasive wheels should be selected, mounted and used only by competent persons and in accordance with manufacturer's instructions. They are relatively fragile and should be stored and handled with care.

19.6.2 Manufacturers' instructions should be followed on the selection of the correct type of wheel for the job in hand. Generally, soft wheels are more suitable for hard material and hard wheel for soft material.

19.6.3 Before a wheel is mounted, it should be brushed clean and closely inspected to ensure that it has not been damaged in storage or transit. The soundness of a vitrified wheel can be further checked by suspending it vertically and tapping it gently. If the wheel sounds dead it is probably cracked, and should not be used.

19.6.4 A wheel should not be mounted on a machine for which it is unsuitable. It should fit freely but not loosely to the spindle; if the fit is unduly tight, the wheel may crack as the heat of the operation causes the spindle to expand.

19.6.5 The clamping nut should be tightened only sufficiently to hold the wheel firmly. When the flanges are clamped by a series of screws, the screws should be first screwed home with the fingers and diametrically opposite pairs tightened in sequence.

19.6.6 The speed of the spindle should not exceed the stated maximum permissible speed of the wheel.

19.6.7 A strong guard, enclosing as much of the wheel as possible, should be provided and kept in position at every abrasive wheel (unless the nature of the work absolutely precludes it use) both to contain wheel parts in the event of a burst and to prevent an operator having contact with the wheel. (See also 19.4.8 above).

19.6.8 Where a work rest is provided, it should be properly secured to the machine and should be adjusted as close as practicable to the wheel, the gap normally being not more than 1.5 mm (1/16 inch).

19.6.9 The side of a wheel should not be used for grinding; it is particularly dangerous when the wheel is appreciably worn.

19.6.10 The work piece should never be held in cloth or pliers.

19.6.11 When dry grinding operations are being carried on or when an abrasive wheel is being trued or dressed, suitable transparent screens should be fitted in front of the exposed part of the wheel or operators should wear properly fitting eye protectors.

19.7 Hydraulic/Pneumatic/High Pressure Jetting Equipment

19.7.1 Personnel using hydraulic/pneumatic/high pressure systems should have received adequate instruction and be competent to use such equipment. Manufacturer's operating guidelines should be followed at all times. Equipment should not be operated at pressures which exceed manufacturers' recommendations.

19.7.2 Before starting work, personnel should ensure that the equipment and supply systems are in sound condition, and that incorporated safety devices are in place and functioning correctly. Where equipment is defective or suspect, systems should be shut down, isolated and depressurised to allow effective change out or repair. Such repairs should be carried out by authorised competent personnel using approved components only.

19.7.3 Before activating a pressure system, and also when closing down, the recommended checks should be made to ensure that no air pockets or trapped pressure are in the system, as these may cause erratic action of the equipment.

19.7.4 When handling hydraulic fluid, personnel should ensure the following:

(a) that the correct grade is used, when topping up systems;

(b) that spillages are cleaned up immediately;

(c) that any splashes of such fluid onto skin areas are cleaned off immediately – many such fluids are mineral based;

(d) that naked lights are kept away from equipment during service/test periods – hydraulic fluids may give off vapours which may be flammable.

19.7.5 Operators using high pressure jetting equipment should wear the correct protective equipment. Such systems may involve use of a heated supply source and operators should therefore guard against splashing and scalding. Warning notices should be displayed on approaches to areas where such work is being undertaken to warn other personnel of the use of such high pressure system in the area. Finally, operators should take great care in ensuring that the direction of such jetting is safe.

19.7.6 When compressed air is used, the pressure should be kept no higher than is necessary to undertake the work satisfactorily.

19.7.7 Compressed air should not be used to clean the working space, and in no circumstances should it be directed at any part of a person's body.

19.8 Hydraulic jacks

19.8.1 Jacks should be inspected before use to ensure that they are in a sound condition and that the oil in the reservoir reaches the minimum recommended level.

19.8.2 Before a jack is operated, care should be taken to ensure that it has an adequate lifting capability for the work for which is to be used and that its foundation is level and of adequate strength.

19.8.3 Jacks should be applied only to the recommended or safe jacking points on equipment.

19.8.4 Equipment under which personnel are required to work should be properly supported with chocks, wedges or by other safe means – never by jacks alone.

19.8.5 Jack operating handles should be removed if possible when not required to be in position for raising or lowering the jack.

19.9 Ropes

19.9.1 The safety of the ship or an individual crew member is often dependent on the rope that is being used.

19.9.2 Many types of rope of both man-made and natural fibre are available, each with different properties and with different resistance to contamination by substances in use about the ship which may seriously weaken the rope. The following table is a guide to the resistance of the main rope types but is indicative only of the possible extent of deterioration of rope; in practice, much depends on the precise formulation of the material, the amount of contamination the rope receives and the length of time and the temperature at which it is exposed to contamination. In some cases, damage may not be apparent even on close visual inspection.

	Resistance to chemicals of ropes made of			
Substance	**Manila or Sisal**	**Polyamide (nylon)**	**Polyester**	**Poly-propylene**
Sulphuric (battery) acid	None	Poor	Good	V Good
Hydrochloric acid	None	Poor	Good	V Good
Typical rust remover	Poor	Fair	Good	V Good
Caustic Soda	None	Good	Fair	V Good
Liquid Bleach	None	Good	V Good	V Good
Creosote, crude oil	Fair	None	Good	V Good
Phenols, Crude tar	Good	Fair	Good	Good
Diesel Oil	Good	Good	Good	Good
Synthetic detergents	Poor	Good	Good	Good
Chlorinated solvents eg trichloroethylene (used in some paint and varnish removers)	Poor	Fair	Good	Poor
Other organic solvents	Good	Good	Good	Good

19.9.3 Ropes should be stored away from heat and sunlight, if possible in a separate compartment which is dry and well ventilated, away from containers of chemicals, detergents, rust removers, paint strippers and other substances capable of damaging them. Mooring ropes should be covered by tarpaulins or, if the ship is on a long voyage, stowed away. Any accidental contamination should be reported immediately for cleansing or other action.

19.9.4 Man-made fibre ropes have high durability and low water absorption and are resistant to rot. Mildew does not attack man-made fibre ropes but moulds can form on them. This will not normally affect their strength.

19.9.5 Polypropylene ropes which have the best all round resistance to attack from harmful substances are generally preferred. However they may be subject to degradation in strong sunlight ("actinic degradation"), and should not be exposed for long periods. They should also be of a type providing grip comparable to that of manila or sisal ropes.

19.9.6 New rope, 3-strand fibre rope and wire rope should be taken out of a coil in such a fashion as to avoid disturbing the lay of the rope.

19.9.7 Rope should be inspected internally and externally before use for signs of deterioration, undue wear or damage.

19.10 Characteristics of man-made fibre ropes

19.10.1 Safe handling of man-made fibre ropes requires techniques which differ from those for handling natural fibre ropes.

19.10.2 Man-made fibre ropes are relatively stronger than those of natural fibre and so for any given breaking strain have appreciably smaller circumferences, but wear or damage will diminish strength to a greater extent than would the same amount of wear or damage on a natural fibre rope. Recommendations for substitution of natural fibre ropes by man-made fibre ropes are given in the following table:

Manila		**Polyamide (Nylon etc)**		**Polyester (Terylene etc)**		**Polypropylene**	
Dia	Size	Dia	Size	Dia	Size	Dia	Size
48 mm	(6)	48 mm	(6)	48 mm	(6)	48 mm	(6)
56 mm	(7)	48 mm	(6)	48 mm	(6)	52 mm	(6.5)
64 mm	(8)	52 mm	(6.5)	52 mm	(6.5)	56 mm	(7)
72 mm	(9)	60 mm	(7.5)	60 mm	(7.5)	64 mm	(8)
80 mm	(10)	64 mm	(8)	64 mm	(8)	72 mm	(9)
88 mm	(11)	72 mm	(9)	72 mm	(9)	80 mm	(10)
96 mm	(11)	80 mm	(10)	80 mm	(10)	88 mm	(11)
111 mm	(14)	88 mm	(11)	88 mm	(11)	96 mm	(11)

Diameter given for 3-strand, size no for 8-strand plaited.

19.10.3 Careful inspection of man-made fibre ropes for wear externally and internally is necessary. A high degree of powdering between strands indicates excessive wear and reduced strength. Ropes with high stretch suffer greater inter-strand wear than others. Hardness and stiffness in some ropes, polyamide (nylon) in particular, may also indicate overworking.

19.10.4 Unlike natural fibre ropes, man-made fibre ropes give little or no audible warning of approaching breaking point.

19.10.5 Rope of man-made material stretches under load to an extent which varies according to the material. Polyamide rope stretches the most. Stretch imparted to man-made fibre rope, which may be up to double that of natural fibre rope, is usually recovered almost instantaneously when tension is released. A break in the rope may therefore result in a dangerous back-lash and an item of running gear breaking loose may be projected with lethal force. Snatching of such ropes should be avoided; where it may occur inadvertently, personnel should stand well clear of the danger areas. The possibility of a mooring or towing rope parting under the load is reduced by proper care, inspection and maintenance and by its proper use in service.

19.10.6 Man-made fibre ropes may easily be damaged by melting if frictional heat is generated during use. Too much friction on a warping drum may fuse the rope with the consequential sticking and jumping of turns, which can be dangerous. Polypropylene is more liable to soften that other material. To avoid fusing, ropes should not be surged unnecessarily on winch barrels. For this reason, a minimum of turns should be used on the winch barrel; three turns are usually enough but on whelped drums one or two extra turns may be needed to ensure a good grip; these should be removed as soon as practicable.

19.10.7 The method of making eye splices in ropes of man-made fibres should be chosen according to the material of the rope.

(a) Polyamide (nylon) and polyester fibre ropes need four full tucks in the splice each with the completed strands of the rope followed by two tapered tucks for which the strands are halved and quartered for one tuck each respectively. The length of the splicing tail from the finished splice should be equal to at least three rope diameters. The portions of the splice containing the tucks with the reduced number of filaments should be securely wrapped with adhesive tape or other suitable material;

(b) polypropylene ropes should be at least three but not more than four full tucks in the splice. The protruding spliced tails should be equal to three rope diameters at least;

(c) polythene ropes should have four full tucks in the splice with protruding tails of three rope diameters at least.

19.10.8 Mechanical fastenings should not be used in lieu of splices on man-made fibre ropes because strands may be damaged during application of the mechanical fastening and the grip of the fastenings may be much affected by slight unavoidable fluctuations in the diameter of the strands.

19.10.9 Man-made fibre stoppers of like material (but not polyamide) should be used on man-made fibre mooring lines, preferably using the method of double and reverse stoppering.

19.11 Work with visual display units (VDU's)

19.11.1 Personnel should be given adequate individual training in the use and capabilities of VDU's. This training should be adapted to the needs and ability of the person and the type of equipment.

19.11.2 Any person using VDU's regularly or frequently and for lengthy periods should be given an eye test by a qualified person before beginning such work and at regular intervals thereafter. If either the eye test of examination by an opthalmologist shows that the person needs special glasses for this work these should be provided.

19.11.3 VDU's should be so positioned that there is sufficient room to move, as necessary, around the equipment. Care should be taken to ensure that cables and wiring do not cause a hazard by obstructing movement.

19.11.4 Lighting should be adequate for the task, with glare and reflection cut to a minimum, and the display on screen should be clear and easy to read. The operator should adjust the brightness and contrast to suit the lighting. When appropriate the operator should be given short rest periods away from the equipment.

19.11.5 There should be adequate leg room and the chair should be comfortable and stable, with adjustable seat height and back rest. The chair should be adjusted by each user to a comfortable position for working – arms approximately horizontal and eyes at the same level as the top of the screen. The keyboard and screen should be adjusted to a comfortable position for keying and viewing.

19.11.6 Exceptionally, certain forms of medication may impair working efficiency on a VDU. Personnel should be aware of this possibility and should seek medical advice if necessary.

19.12 Personnel Lifts and Lift Machinery

19.12.1 Before a lift is put into normal service it must be tested and examined by a competent person and a certificate or report issued.

19.12.2 Regular examination must be carried out by a competent person at intervals not exceeding six months and a certificate or report issued. More detailed examination and testing of parts of the lift installation must be carried out at periodic intervals.

19.12.3 Details of tests, examinations and certificates are to be found in Inspection Regulations for lifting appliances and elevators – see DMS Circular 12/2002, and Chapter 7.5 of this Code.

19.12.4 An initial risk assessment must be made to identify hazards associated with work on each lift installation, including work requiring access to the lift trunk. Safe working procedures must be drawn up for each lift installation. Persons who are to be authorised to carry out work on or inspection of the lift installation must comply with these procedures.

19.12.5 The specific areas that the risk assessment should address should include, as appropriate:

(a) whether there are safe clearances above and below the car at the extent of its travel;

(b) whether a car top control station is fitted and its means of operation;

(c) the working conditions in the machine and pulley rooms.

19.12.6 Based on the findings of the risk assessment, it is recommended that a permit-to-work system, as described in Chapter 15, is adopted when it is necessary for personnel to enter the lift trunk or to override the control safety systems. It is strongly recommended that no person should work alone on lifts.

19.12.7 Any work carried out on lifts must only be performed by authorised persons familiar with the work and the appropriate safe working procedures. These procedures must include provision for both the safety of persons working on the lift and other who may also be at risk such as intending passengers.

19.12.8 Appropriate safety signs must be prominently displayed in the area and also on control equipment such as call lift buttons. Barriers must be used when it is necessary for lift landing doors to remain open to the lift trunk.

19.12.9 Experience indicates that the most important single factor in minimising risk of accidents is the avoidance of misunderstanding between personnel. A means of communication to the authorising officer and between those involved in working on the lift must be established and maintained at all times. This might be by telephone, portable-hand held radio or a person-to-person chain. Whatever the arrangement, action should only be taken as a result of the positive receipt of confirmation that the message is understood.

19.12.10 Before attempting to gain access to the trunk, whenever possible the mains switch should be locked in the OFF position (or alternatively the fuses should be withdrawn and retained in a safe place) and an appropriate safety sign must be positioned at the point of such isolation. This should include both main and emergency supplies. In addition, the landing doors should not be allowed to remain open longer than necessary; the machine room should be protected against unauthorised entry and after completion of work a check must be made to ensure that all equipment used in the operation has been cleared from the well.

19.12.11 When it is necessary for personnel to travel on top of a car, safety can be enhanced considerably by the use of the car top control station (comprising a stopping device and an inspection switch/control device) required by CYS EN 81-1: 1998 standard (see appendix 1). Account should be taken of the arrangement and location of the control station i.e. whether the stopping device can be operated before stepping on to the car top. Persons must not travel on the top of the lift car if no stopping device is fitted.

19.13 Laundry equipment

19.13.1 All personnel required to work in the laundry or use any part of the equipment there must be fully instructed on the proper operation of the machinery. A person under 18 years of age should not work on industrial washing machines, hydro-extractors, calendars or garment presses unless they are fully instructed as to precautions to be observed, and have received sufficient training in work at the machine or are under close supervision by a suitably experienced person.

19.13.2 Equipment should be inspected before use for faults and damage. Particular attention should be paid to the automatic cut-off or interlocking arrangements on washing

machines, hydro-extractors etc. and the guards and emergency stops on presses, calendars, mangling and wringing machines. Any defect or irregularity found during inspection, or apparent during operation of the equipment, should be reported immediately and the use of the machine discontinued until such time as any necessary repairs or adjustments have been carried out. A notice warning against use should be displayed prominently on the defective machine.

19.13.3 Frequent and regular inspection, with thorough checking of all electrical equipment and apparatus, is also necessary to ensure the standard of maintenance essential for laundries.

19.13.4 Machines should not be overloaded and loads should be distributed uniformly.

19.13.5 Reliance should not be placed entirely on interlocking or cut-off arrangements on the doors of washing machines, hydro-extractors and drying tumblers etc.; doors should not be opened until all movement has ceased.

Chapter 20 - Lifting Plant

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

20.1 Introduction

20.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of lifting plant.

20.1.2 The general principles given in Chapter 19 apply equally to lifting plant. However, this Chapter gives more specific guidance.

20.1.3 In interpreting this Chapter, proper account should be taken of any European Standards or alternative equivalents.

20.2 General requirements

20.2.1 Lifting appliances should be:

(a) securely anchored, or

(b) adequately ballasted or counterbalanced, or

(c) supported by outriggers,

as necessary to ensure their stability when lifting.

20.2.2 If counterbalance weights are moveable, effective precautions should be taken to ensure that the lifting appliance is not used for lifting in an unstable condition. In particular all weights should be correctly installed and positioned.

20.2.3 Lifting appliances with pneumatic tyres should not be used unless the tyres are in a safe condition and inflated to the correct pressures. Means to check this should be provided.

20.2.4 The operator should check safety devices fitted to lifting appliances before work starts and at regular intervals thereafter to ensure that they are working properly.

Controls

20.2.5 Controls of lifting appliances should be permanently and legibly marked with their function and their operating directions shown by arrows or other simple means, indicating the position or direction of movement for hoisting or lowering, slewing of luffing etc.

20.2.6 Make-shift extensions should not be fitted to controls nor any unauthorised alteration made to them. Foot-operated controls should have slip-resistant surfaces.

20.2.7 No lifting device should be used with any locking pawl, safety attachments or device rendered inoperative. If, exceptionally, limit switches need to be isolated in order to lower a crane to its stowage position, the utmost care should be taken to ensure the operation is completed safely.

Operation

20.2.8 A powered appliance should always have a person at the controls while it is in operation; it should never be left to run with a control secured in the ON position.

20.2.9 If any powered appliance is to be left unattended with the power on, loads should be taken off and controls put in “neutral” or “off” positions. Where practical, controls should be locked or otherwise inactivated to prevent accidental restarting. When work is completed, power should be shut off.

20.2.10 The person operating any lifting appliance should have no other duties which might interfere with their primary task. They should be in a proper and protected position, facing controls and, so far as is practicable, with a clear view of the whole operation.

20.2.11 Where the operator of the lifting appliance does not have a clear view of the whole of the path of travel of any load carried by that appliance, appropriate precautions should be taken to prevent danger. Generally this requirement should be met by the employment of a competent and properly trained signaller designated to give instructions to the operator. A signaller includes any person who gives directional instructions to an operator while they are moving a load, whether by manual signals, by radio or otherwise.

20.2.12 The signaller should have a clear view of the path of travel of the load, when the operator of the lifting appliance cannot see it.

20.2.13 Where necessary, additional signallers should be employed to give instructions to the first signaller.

20.2.14 Every signaller should be in a position that is:

(a) safe; and

(b) in plain view of the person to whom they are signalling unless an effective system of radio or other contact is in use.

20.2.15 All signallers should be instructed in and should follow a clear code of signals, agreed in advance and understood by all concerned in the operation. Examples of hand signals recommended for use with lifting appliances on ships are shown in Annex 20.1 Code of hand signals.

20.2.16 If a load can be guided by fixed guides, or by electronic means, or in some other way, so that it is as safely moved as if it was being controlled by a competent team of driver and signallers, signallers will not be necessary.

Use of lifting equipment

20.2.17 Loads should if possible not be lifted over a person or any access way, and personnel should avoid passing under a load which is being lifted.

20.2.18 No person should be lifted by lifting plant except where the plant has been designed or especially adapted and equipped for the purpose or for rescue or in similar emergencies.

20.20.19 All loads should be properly slung and properly attached to lifting gear, and all gear properly attached to appliances.

20.2.20 The use of lifting appliances to drag heavy loads with the fall at an angle to the vertical is inadvisable because of the friction and other factors involved and should only take place in exceptional circumstances where the angle is small, there is ample margin between the loads to be handled and the safe working load of the appliance, and particular care is taken. In all other cases winches should be used instead. Derricks should never be used in union purchase for such work.

20.2.21 Any lifts by two or more appliances simultaneously can create hazardous situations and should only be carried out where unavoidable. They should be properly conducted under the close supervision of a responsible person, after thorough planning of the operation. Section 20.5 provides guidance on the use of derricks in union purchase.

20.2.22 Lifting appliances should not be used in a manner likely to subject them to excessive over-turning moments.

20.2.23 Ropes, chains and slings should not be knotted.

20.2.24 A thimble or loop splice in any wire rope should have at least three tucks with a whole strand of rope and two tucks with one half of the wires cut out of each strand. The strands in all cases should be tucked against the lay of the rope. Any other form of splice which can be shown as efficient as the above can also be used.

20.2.25 Lifting gear should not be passed around edges liable to cause damage without appropriate packing.

20.2.26 Where a particular type of load is normally lifted by special gear, such as plate clamps, other arrangements should only be used if they are equally safe.

20.2.27 The manner of use of natural and man-made fibre ropes, magnetic and vacuum lifting devices and other gear should take proper account of the particular limitations of the gear and the nature of the load to be lifted.

20.2.28 Wire ropes should be regularly inspected and treated with suitable lubricants. These should be thoroughly applied so as to prevent internal corrosion as well as corrosion on the outside. The ropes should never be allowed to dry out.

20.2.29 Lifting operations should be stopped if wind conditions make it unsafe to continue with them.

20.2.30 Cargo handling equipment that is lifted onto or off ships by crane or derrick should be provided with suitable points for the attachment of lifting gear, so designed as to be safe in use. The equipment should also be marked with its own gross weight and safe working load.

20.2.31 Before any attempt is made to free equipment that has become jammed under load, every effort should first be made to take off the load safely. Precautions should be taken to guard against sudden or unexpected freeing. Others not directly engaged in the operation should keep in safe or protected positions.

20.2.32 When machinery and, in particular, pistons are to be lifted by means of screw-in bolts, the eye-bolts should be checked to ensure that they have collars, that the threads are in good condition and that the bolts are screwed hard down on to their collars. Screw holds for lifting bolts in piston heads should be cleaned and the threads checked to see that they are not wasted before the bolts are inserted.

Safe Working Load (SWL)

20.2.33 A load greater than the safe working load should not be lifted unless:

(a) a test is required by the Inspection Regulation for Lifting Appliances and Elevators (see Chapter 7.5); and

(b) the weight of the load is known and is the appropriate proof load; and

(c) the lift is a straight lift by a single appliance; and

(d) the lift is supervised by the competent person who would normally supervise a test and carry out a thorough inspection; and

(e) the competent person specifies in writing that the lift is appropriate in weight and other respects to act as a test of the plant, and agrees to the detailed plan of the lift; and

(f) no person is exposed to danger thereby.

20.2.34 Any grab fitted to a lifting appliance should be of an appropriate size, taking into account the safe working load of the appliance, the additional stresses on the appliance likely to result from the operation, and the material being lifted.

20.2.35 In the case of a single sheave block used in double purchase the working load applied to the wire should be assumed to equal half the load suspended from the block.

20.2.36 The safe working load of a lift truck means its actual lifting capacity, which relates the load which can be lifted to, in the case of a fork lift truck, the distance from the centre of gravity of the load from the heels of the forks. It may also specify lower capacities in certain situations, e.g. for lifts beyond a certain height.

20.3 Use of winches and cranes

20.3.1 The drum end of wire runners or falls should be secured to winch barrels or crane drums by proper clamps or U-bolts. The runner or fall should be long enough to leave at least three turns on the barrel or drum at maximum normal extension. Slack turns of wire or rope on a barrel or drum should be avoided as they are likely to pull out suddenly under load.

20.3.2 When a winch is changed from single to double gear or vice versa, any load should first be released and the clutch should be secured so that it cannot become disengaged when the winch is working.

20.3.3 Steam winches should be so maintained that the operator is not exposed to the risk of scalding by leaks of hot water and steam.

20.3.4 Before a steam winch is operated, the cylinders and steam pipes should be cleared of water by opening the appropriate drain cocks. The stop valve between winch and deck steam line should be kept unobstructed. Adequate measures should be taken to prevent steam obscuring the driver's vision in any part of a working area.

20.3.5 Ships' cranes should be properly operated and maintained in accordance with manufacturers' instructions. Companies, employers and masters, as appropriate, should ensure that sufficient technical information is available including the following information:

(a) length, size and safe working load of falls and topping lifts;

(b) safe working load of all fittings;

(c) boom limiting angles;

(d) Manufacturers' instructions for replacing wires, topping up hydraulics and other maintenance as appropriate.

20.3.6 Power operated rail mounted cranes should have the following facilities incorporated in their control systems:

(a) facilities to prevent unauthorised start up ;

(b) an efficient braking mechanism which will arrest the motion along the rails, and where safety constraints require, emergency facilities operated by readily accessible controls or automatic systems should be available for braking or stopping equipment in the event of failure of the main facility;

(c) guards which reduce as far as possible the risk of the wheels running over persons' feet, and which will remove loose materials from the rails.

20.3.7 When a travelling crane is moved, any necessary holding bolts or clamps should be replaced before operations are resumed.

20.3.8 Access to a crane should be always by the proper means provided. Cranes should be stationary while accessing.

20.4 Use of derricks

20.4.1 Ships' derricks should be properly rigged and employers and masters should ensure that rigging plans are available containing the following information:

(a) position and size of deck eye-plates;

(b) position of inboard and outboard booms;

(c) maximum headroom (i.e. permissible height of cargo hook above hatch coaming);

(d) maximum angle between runners;

(e) position, size and safe working load of blocks;

(f) length, size and safe working load of runners, topping lifts, guys and preventers;

(g) safe working load of shackles;

(h) position of derricks producing maximum forces (e.g. as shown in figure 19 of BS MA 48:1976 standard see appendix 1);

(i) optimum position for guys and preventers to resist maximum forces as at (h);

(j) combined load diagrams showing forces for a load of 1 tonne or the safe working load;

(k) guidance on the maintenance of the derrick rig.

20.4.2 The operational guidance in the remainder of this section applies generally to the conventional type of ship's derrick. For other types, such as the "Hallen" and "Stulken" derricks, manufacturers' instructions should be followed.

20.4.3 Runner guides should be fitted to all derricks so that when the runner is slack, the bight is not a hazard to persons walking along the decks. Where the rollers are fitted to runner guides, they should rotate freely.

20.4.4 Before a derrick is raised or lowered, all persons on deck in the vicinity should be warned so that no person stands in, or is in danger from, bights of wire and other ropes. All necessary wires should be flaked out.

20.4.5 When a single span derrick is being raised, lowered or adjusted, the hauling part of the topping lift or bull-wire (i.e. winch end whip) should be adequately secured to the drum end. (See 20.3.1).

20.4.6 The winch driver should raise or lower the derrick at a speed consistent with the safe handling of the guys.

20.4.7 Before a derrick is raised, lowered or adjusted with a topping lift purchase, the hauling part of the span should be flaked out for its entire length in a safe manner. Someone should be available to assist the person making fast to the bitts or cleats. Where the hauling part of a topping lift purchase is led to a derrick span winch, the bull-wire should be handled in the same way.

20.4.8 To fasten the derrick in its final position, the topping lift purchase should be secured to bitts or cleats by first putting on three complete turns followed by four crossing turns and finally securing the whole with a lashing to prevent the turns jumping off due to the wire's natural springiness.

20.4.9 When a derrick is lowered on a topping lift purchase, someone should be instructed for lifting and holding the pawl bar, ready to release it should the need arise; the pawl should be fully engaged before the topping lift purchase or bull-wire is released. The person employed on this duty should not attempt or be given any other task until this operation is complete; in no circumstances should the pawl bar be wedged or lashed up.

20.4.10 A derrick with a topping winch, and particularly one that is self-powered, should not be topped hard against the mast, table or clamp in such a way that the initial heave required to free the pawl bar prior to lowering the derrick cannot be achieved without putting an undue strain on the topping lift purchase and its attachments.

20.4.11 A heel block should be secured additionally by means of a chain or wire so that the block will be pulled into position under load but does not drop when the load is released.

20.4.12 The derrick should be lowered to the deck or crutch and properly secured whenever repairs or changes to the rig are to be carried out.

20.4.13 If heavy cargo is to be dragged under deck with ship's winches, the runner should be led directly from the heel block to avoid overloading the derrick boom and rigging. Where a heavy load is to be removed, a snatch block or bull wire should be used to provide a fair-lead for the runner and to keep the load clear of obstructions.

20.5 Use of derricks in union purchase

20.5.1 When using union purchase the following precautions should be strictly taken to avoid excessive tensions:

(a) the angle between the married runners should not normally exceed 90º (or 110º in special circumstances);

(b) the cargo sling should be kept as short as possible so as to clear the bulwarks without the angle between the runners exceeding 90º (or 110º in special circumstances);

(c) derricks should be topped as high as practicable consistent with safe working;

(d) the derricks should not be rigged further apart than is absolutely necessary.

20.5.2 The following examples will show how rapidly loads increase on derricks, runners and attachments as the angle between runners increases:

at 60º included angle, the tension in each runner would be just over half the load;

at 90º the tension would be nearly three-quarters of the load;

at 195º the tension would be nearly 11 times the load.

20.5.3 When using union purchase, winch operators should wind in and pay out in step, otherwise dangerous tensions may develop in the rig.

20.5.4 An adequate preventer guy should always be rigged on the outboard side of each derrick when used in union purchase. The preventer guy should be looped over the head of the derrick, and as close to and parallel with the outboard guy as available fittings permit. Each guy should be secured to individual and adequate deck or other fastenings.

20.5.5 Narrow angles between derricks and outboard guys and between outboard guys and the vertical should be avoided in union purchase as these materially increase the loading on the guys. The angle between the outboard derrick and its outboard guy and preventer should not be too large and may cause the outboard derrick to jack-knife. In general, the inboard derrick guys and preventer should be secured as nearly as possible at an angle of 90º to the derrick.

20.6 Use of stoppers

20.6.1 Where fitted, mechanical topping lift stoppers should be used. Where chain stoppers are used, they should ALWAYS be applied by two half-hitches in the form of a cow hitch suitably spaced with the remaining chain and rope tail backed round the wire and held taut to the wire.

20.6.2 A chain stopper should be shackled as near as possible in line with the span downhaul and always to an eyeplate, not passed round on a bight which would induce bending stresses similar to those in a knotted chain.

20.6.3 No stopper should be shackled to the same eyeplate as the lead block for the span downhaul; this is particularly hazardous when the lead block has to be turned to take the downhaul to the winch or secure it to bitts or cleats.

20.6.4 The span downhaul should always be eased to a stopper and the stopper should take the weight before turns are removed from the winch, bitts or cleats.

20.7 Overhaul of cargo gear

20.7.1 When a cargo block or shackle is replaced, care should be taken to ensure that the replacement is of the correct type, size and safe working load necessary for its intended use.

20.7.2 All shackles should have their pins effectively secure or seized with wire.

20.7.3 A special check should be made on completion of the work to ensure that all the split pins in blocks etc. have been replaced and secured.

20.7.4 On completion of the gear overhaul, all working places should be cleaned of oil or grease.

20.8 Trucks and other vehicles/appliances

20.8.1 Where vehicles/work-trucks or other mechanical appliances are used aboard the vessel to carry personnel, they should where possible be constructed so as to prevent them overturning, or should be equipped or adapted to limit the risk to those carried by one or more of the following protection measures:

(a) an enclosure for the driver;

(b) a structure ensuring that, should the vehicle overturn, safe clearance remains between the ground and the parts of the vehicle where people are located when it is in use;

(c) a structure restraining the workers on the driving seat so as to prevent them from being crushed.

These protection structures may be an integral part of the vehicle/work equipment. They are not required when the work equipment is stabilised or where the equipment design makes roll-over impossible.

20.8.2 Personnel other than the driver should not be carried on a truck unless it is constructed or adapted for the purpose. Riding on the forks of a truck is particularly dangerous. The driver should be careful to keep all parts of the body within the limits of the width of the truck or load.

20.8.3 Trucks for lifting and transporting should be used only by competent persons and only when the ship is in still water; they should never be used when vessels are in a seaway.

20.8.4 Appliances powered by internal combustion engines should not be used in enclosed spaces unless the spaces are adequately ventilated. The engine should not be left running when the truck is idle.

20.8.5 When not in use or left unattended whilst the vessel is in port, trucks for lifting and transporting should be aligned along the length of the ship with brakes on, operating controls locked and, where applicable, the forks tilted forward flush with the deck and clear of the passageway. If the trucks are on an incline, their wheels should be chocked.

If not to be used for some time, and at all times whilst at sea, appliances should be properly secured to prevent movement.

20.8.6 No attempt should be made to handle a heavy load by the simultaneous use of two trucks. A truck should not be used to handle a load greater than its marked capacity or to move insecure or unsafe loads.

20.8.7 Tank containers should not be lifted directly with the forks of for lift trucks, because of the risks of instability and of damaging the container with the ends of the forks. Tank containers may be lifted using fork lift trucks fitted with suitably designed side or top lifting attachments but care should be exercised due to the risk of surge in partly filled tanks.

20.9 Defect reporting and testing – Advice to competent person

20.9.1 There is a legal requirement for lifting plant to be tested every five years (see Section 7.5.). This section gives advice to the competent person carrying out the test.

20.9.2 The requirements for testing a lifting plant will be met if before use one of the following appropriate tests is carried out:

(a) proof of loading the plant concerned; or

(b) in appropriate cases by testing a sample to destruction; or

(c) in the case of re-testing after repairs or modifications, such a test that satisfies the competent person who subsequently examines the plant (the re-testing of ships' lifting appliances may be effected by means of a static test e.g. by dynamometer where appropriate; or

(d) in the case of a lift truck, the test should be a functional test to verify that the truck is able to perform the task for which it was designed. This test should include a check to ensure that all controls function correctly and that all identification and capacity plates are fitted and contain correct information. A dynamic test should include travelling and manoeuvring, stacking, a lowering speed check and tilt leakage test with the rated load including relevant attachments where appropriate. Following the test the truck should be examined to ensure that it has no defects which would render it unsuitable for use.

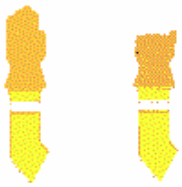
20.9.3 Any defect found in any lifting plant, including plant provided by a shore authority, should be reported immediately to the master or to another responsible person who should take appropriate action.

20.9.5 Similar principles apply to cargo securing devices as to lifting equipment. The crew and persons employed for the securing of cargoes should be instructed in the correct application and use of the cargo securing gear on board the ship. For guidance on the securing of cargoes and handling of security devices refer to the ship's approved Cargo Securing Manual.

Annex 20.1 Coded Signs to be used

Preliminary remark:

The following sets of coded signals are examples of those implemented by the EU Directive 92/58/EEC, but where there are accepted national signals in common use (as indicated*) these too are acceptable. See paragraph 20.2.15.

Meaning	*Description*	*Illustration*
	A. General hand signals	
START Attention Start of Command	both arms are extended horizontally with the palms facing forward.	
TAKING THE STRAIN or INCHING THE LOAD	the right arm points upwards with the palm facing forwards. The fingers clenched and then unclenched.	 *
STOP Interruption End of movement	the right arm points upwards with the palm facing forwards.	
END of the operation (operations cease)	both hands are clasped at chest height.	
	OR	
	both arms extended at 45° downwards and lower arms crossed back and forth sharply across torso.	 *

B. Vertical movements

RAISE

the right arm points upwards with the palm facing forward and slowly makes a circle.

LOWER

the right arm points downwards with the palm facing inwards and slowly makes a circle.

DERRICKING THE JIB

signal with one hand. Other hand on head

Jib up

Jib down

TELESCOPING THE JIB

signal with one hand. Other hand on head

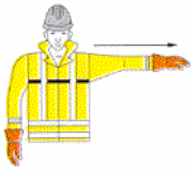
Extend jib

Retract jib

VERTICAL DISTANCE

the hands indicate the relevant distance.

C. Horizontal movements

MOVE FORWARDS (Travel to me)	both arms are bent with the palms facing upwards and the forearms make slow movements towards the body	
MOVE BACKWARDS (Travel from me)	both arms are bent with the palms facing downwards and the forearms make slow movements away from the body.	
RIGHT to the signalman's (in the direction indicated)	the right arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the right.	
LEFT to the signalman's (in the direction indicated)	the left arm is extended more or less horizontally with the palm facing downwards and slowly makes small movements to the left.	
HORIZONTAL DISTANCE	the hands indicate the relevant distance.	
SLEWING (In direction indicated)	both arms close to side extending one arm 90° from elbow.	 

D. Danger

DANGER EMERGENCY STOP	both arms point upwards with the palms facing forwards.	

E. Other

SECURE Secure the Load	both arms are crossed closely to the chest with hands clenched.	 *
TWISTLOCKS Twistlocks on/off	the left arm points upwards. Rotate wrist of left hand clockwise signalling twist on, and anticlockwise for signalling twist off.	 *

F. Operating instructions

QUICK	all movements faster.
SLOW	all movements slower.

Chapter 21 - Maintenance

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

21.1 Introduction

21.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of maintenance.

21.2 General

21.2.1 No maintenance work or repair which might affect the supply of water to the fire main or sprinkler system should be started without the prior permission of the master.

21.2.2 No alarm system should be isolated without the permission of the master

21.2.3 Means of access to fire fighting equipment, emergency escape routes and watertight doors should never be obstructed.

21.2.4 Safety guards on machinery or equipment should only be removed when the machinery is not operating. If removal is essential for maintenance or examination of the equipment, the following precautions should be taken:

removal should be authorised by a responsible person, and only a competent person should carry out the work or examination;

there should be adequate clear space and lighting for the work to be done;

anyone working close to the machinery should be told what the risks are and instructed in safe systems of work and precautions to take;

a warning notice should be conspicuously posted.

21.2.5 Solvents used for cleaning can be toxic, and should always be used in accordance with the manufacturers' instructions. The area should be well ventilated, and in confined spaces, smoking should be prohibited.

21.3 Floor plates and handrails

21.3.1 Lifting handles should be used when a floor plate is removed or replaced. When lifting handles are not provided, the plate should be levered up with a suitable tool and a chock inserted before lifting. On no account should fingers be used to prise up the edges.

21.3.2 Whenever floor plates or handrails are removed, warning notices should be posted, the openings should be effectively fenced or guarded and the area well-illuminated.

21.4 Maintenance of machinery

21.4.1 Before machinery is serviced or repaired, measures should be taken to prevent it being turned on or started automatically or from a remote control system:

electrically-operated machinery should be isolated from the power supply;

steam-operated machinery should have both steam and exhaust valves securely closed and, where possible, the valves locked or tied shut or some other means employed to indicate that the valves should not be opened. The same care is required when dealing with heated water under pressure as is required when working on steam-operated machinery or pipework;

in all cases, warning notices should be posted at or near the controls giving warning that the machinery concerned is not to be used.

21.4.2 Where valves or filter covers have to be removed or similar operations have to be performed on pressurised systems, that part of the system should be isolated by closing the appropriate valves. Drain cocks should be opened to ensure that pressure is off the system.

21.4.3 When joints of pipes, fittings etc. are being broken, the fastenings should not be completely removed until the joint has been broken and it has been established that no pressure remains within.

21.4.4 Before a section of the steam pipe system is opened to the steam supply, all drains should be opened. Steam should be admitted very slowly and the drains kept open until all the water has been expelled.

21.4.5 Maintenance or repairs to, or immediately adjacent to, moving machinery should be permitted only in circumstances where no danger exists or where it is impracticable for the machinery to be stopped. Close-fitting clothing should be worn and longhair should be covered (see 4.5.5). The officer in charge should consider whether it is necessary in the interests of safety for a second person to be in close attendance whilst the work is being carried out.

21.4.6 Heavy parts of dismantled machinery temporarily put aside should be firmly secured against movement in a seaway and, as far as practicable, be clear of walkways. Sharp projections on them should be covered when reasonably practicable.

21.4.7 Spare gear, tools and other equipment or material should never be left lying around, especially near to stabiliser or steering gear rams and switchboards.

21.4.8 A marlin spike, steel rod, or other suitable device should be used to align holes in machinery being reassembled or mounted; fingers should never be used.

21.4.9 When guards or other safety devices have been removed from machinery, they should be replaced immediately the work is completed and before the machinery or equipment is tested.

21.4.10 An approved safety lamp should always be used for illuminating spaces where oil or oil vapour is present. Vapour should be dispersed by ventilation before work is done.

21.5 Boilers

21.5.1 Boilers should be opened only under the direction of an engineering officer. Care should be taken to check, after emptying that the vacuum is broken before manhole doors are removed. Even if an air cock has been opened to break the vacuum, the practice should always be to loosen the manhole door nuts and break the joint before the removal of the dogs and knocking in the doors. The top manhole doors should be removed first. Personnel should stand clear of hot vapour when doors are opened.

21.5.2 Personnel should not enter any boiler, boiler furnace or boiler flue until it has cooled sufficiently to make work in such places safe

21.5.3 Before entry is permitted to a boiler which is part of a range of two or more boilers, the engineer officer in charge should ensure that either:

(a) all inlets through which steam or water might enter the boiler from any other part of the range have been disconnected, drained and left open to atmosphere;

or, where that is not practicable;

(b) all valves or cocks, including blowdown valves controlling entry of steam or water, have been closed and securely locked, and notices posted to prevent them being opened again until authorisation is given.

The above precautions should be maintained whilst personnel remain in the boiler.

21.5.4 Personnel cleaning tubes, scaling boilers, and cleaning backends, should wear appropriate protective clothing and equipment including goggles and respirators.

21.5.5 A boiler is a confined space, and therefore potentially a dangerous space. Special care should be exercised before a boiler is entered which has not been in use for some time or where chemicals have been used to prevent rust forming. The atmosphere may be deficient in oxygen and tests should be carried out before any person is allowed to enter. See Chapter 16 for advice on entering enclosed spaces.

21.6 Auxiliary machinery and equipment

21.6.1 Before work is started on an electric generator or auxiliary machine, the machine should be stopped and the starting air valve or similar device should be secured so that it cannot be operated. A notice should be posted warning that the machine is not to be started nor the turning gear used. To avoid the danger of motoring and electric shock to any person working on the machine, it should be isolated electrically from the switchboard or starter before work is commenced. The circuit-breaker should be opened and a notice posted at the switchboard warning personnel that the breaker is to be closed. Where practicable, the circuit-breaker should be locked open.

21.6.2 No attempt should be made to start a diesel engine without first barring round with the indicator cocks open. The barring gear should then be disengaged before starting the engine.

21.6.3 Oily deposits of flammable material should never be allowed to build up in the way of diesel engine relief valves, crankcase explosion doors or scavenge belt safety discs.

21.6.4 Flammable coatings should never be applied to the internal surfaces of air starting reservoirs.

21.6.5 When testing a diesel engine fuel injector, or other high pressure parts of injection equipment, jets should not be allowed to spray unprotected skin.

21.6.6 Oxygen should on no account be used for starting engines. To do so would probably cause a violent explosion.

21.7 Main engines

21.7.1 Where necessary, suitable staging, adequately secured, should be used to provide a working platform.

21.7.2 Before anyone is allowed to enter or work in the main engine crankcase or gear case, the turning gear should be engaged and a warning notice posted at the start position. The spaces should be well ventilated and the atmosphere tested.

21.7.3 Before the main engine turning gear is used, a check should be made to ensure that all personnel are clear of the crankcase and any moving part of the main engine, and that the duty deck officer has confirmed that the propeller is clear.

21.7.4 If a hot bearing has been detected in a closed crankcase, the crankcase should not be opened until sufficient time has been allowed for the bearing to cool down, otherwise the entry of air could create an explosive air/oil vapour mixture.

21.7.5 The opened crankcase or gear case should be well-ventilated to expel all flammable gases before any source of ignition, such as a portable lamp (unless of an approved safety type) is brought near to it.

21.7.6 Before the main engine is restarted, a responsible engineer officer should check that the shaft is clear and inform the duty deck officer who should confirm that the propeller is clear.

21.8 Refrigeration machinery and refrigerated compartments

21.8.1 No one should enter a refrigerated chamber without first informing a responsible officer (see section 14.10). Should it be known or suspected that the refrigerant has leaked into any compartment, no attempt should be made to enter that compartment without appropriate precautions being taken.

21.8.2 Personnel charging or repairing refrigeration plants should fully understand the precautions to be observed when handling the refrigerant.

21.8.3 When refrigerant plants are being charged through a charging connection in the compressor suction line, it is sometimes the practice to heat the cylinder to evaporate any remains of the liquid refrigerant. This should be done only by placing the cylinder in hot water or some similar indirect method and never by heating the cylinder directly with a blow lamp or other flame. Advice on the handling and storage of gas cylinders is given in section 22.8.

21.8.4 If it is necessary for repair or maintenance to apply heat to vessels containing refrigerant, appropriate valves should be opened to prevent build-up of pressure within the vessels.

21.8.5 Further advice on working with refrigeration plant is given in section 14.10.

21.9 Steering gear

21.9.1 Generally, work should not be done on steering gear when a ship is under way. If it is necessary to work on steering gear when the vessel is at sea, the ship should be stopped and suitable steps taken to immobilise the rudder by closing the valves on the hydraulic cylinders or by other appropriate and effective means.

21.10 Hydraulic and pneumatic equipment

21.10.1 Before repairs to or maintenance of hydraulic and pneumatic equipment is undertaken any load should be removed, or if this is not practical, adequately supported by other means. All pressure in the system should be released. The part being worked upon should be isolated from the power source and a warning notice displayed by the isolating valve, which should be locked.

21.10.2 Precautions should be taken against the possibility of residual pressure being released when unions or joints are broken.

21.10.3 Absolute cleanliness is essential to the proper and safe operation of hydraulic and pneumatic systems; the working area and tools, as well as the system and its components, should be kept clean during servicing work. Care should also be taken to ensure that replacement units are clean and free from any contamination, especially fluid passages.

21.10.4 Only replacement components which comply with manufacturers' recommendations should be used. Any renewed or replacement item of equipment should be properly inspected or tested before being put into operation within the system.

21.10.5 Since vapours from hydraulic fluid may be flammable, naked lights should be kept away from hydraulic equipment being tested or serviced.

21.10.6 A jet of hydraulic fluid under pressure should never be allowed to spray onto unprotected skin. Any hydraulic fluid spilt on the skin should be thoroughly washed off.

21.11 Electrical equipment

21.11.1 The risks of electric shock are much greater on board a ship than they are normally ashore because wetness, high humidity and high temperature (including sweating) reduce the contact resistance of the body. In those conditions, severe and even fatal shocks may be caused at voltages as low as 60V. It should also be borne in mind that cuts and abrasions significantly reduce skin resistance.

21.11.2 A notice of instructions on the treatment of electric shock should be posted in every place containing electrical equipment and switchgear. Immediate on the spot treatment of an unconscious patient is essential.

21.11.3 Before any work is done on electrical equipment, fuses should be removed or circuit breakers opened to ensure that all related circuits are dead. If possible, switches and circuit breakers should be locked open or, alternatively, a "not to be closed" notice attached (see section 21.6). Where a fuse has been removed, it should be retained by the person working on the equipment until the job is finished. A check should be made that any interlocks or other safety devices are operative. Additional safety precautions are necessary to ensure safety when work is to be undertaken on high voltage equipment (designed to operate at a nominal system voltage in excess of 1Kv). The work should be carried out by, or under the direct supervision of, a competent person with sufficient technical knowledge and a permit-to-work system should be operated.

21.11.4 Some parts of certain types of equipment may remain live even when the equipment is switched off. Power should always be cut off at the mains.

21.11.5 Flammable materials should never be left or stored near switchboards.

21.11.6 Work on or near live equipment should be avoided if possible but when it is essential for the safety of the ship or for testing purposes, the following precautions should be taken:

a second person, who should be competent in the treatment of electric shock, should be continually in attendance;

the working position adopted should be safe and secure to avoid accidental contact with the live parts. Insulated gloves should be worn where practicable;

contact with the deck, particularly if it is wet, should be avoided. Footwear may give adequate insulation if it is damp or has metal studs or rivets. The use of a dry insulating mat at all times is recommended;

contact with bare metal should be avoided. A hand-to-hand shock is especially dangerous. To minimise the risk of a second contact should the working hand accidentally touch a live part, one hand should be kept in a trouser pocket whenever practicable;

wrist watches, metal identity bracelets and rings should be removed. They provide low resistance contacts with the skin. Metal fittings on clothing or footwear are also dangerous.

21.11.7 Meter probes should have only minimum amounts of metal exposed and insulation of both probes should be in good condition. Care should be taken that the probes do not short circuit adjacent connections. When measuring voltages that are greater than 205V, the probe should be attached and removed with the circuit dead.

21.12 Main switchboards

21.12.1 The internal cleaning and maintenance of the Main Switchboard must only be carried out while it is in a "dead" condition; after a full Risk Assessment has been carried out, as described in Chapter 1; and, a formal Permit-To-Work issued, as described in Chapter 15.

21.12.2 The Risk Assessment will identify the actions and checks required to make the Switchboard safe, and these actions and checks will be identified in the Permit-To-Work. The major checks to be listed on the Permit-To-Work will identify and verify that the necessary Inter-connections to and from; and/or within, the Main Switchboard are disconnected. These will include but are not limited to:

(a) the Shore Power Supply;
(b) the Emergency Generator;
(c) the Emergency Power Supply.

21.12.3 The internal cleaning and internal maintenance of the Main Switchboard would, in general, be an integral part of a ship's dry-dock programme or that of an extended maintenance programme.

21.12.4 Further safety guidance on working on electrical equipment is to be found in 21.11.

21.13 Distribution switchboards

21.13.1 Safety guidance on working on electrical distribution switchboards is to be found in 21.11.

21.14 Electrical machinery

21.14.1 Safety guidance on working on electrical machinery is to be found in 21.11

21.15 Storage batteries - general

21.15.1 When a battery is being charged it "gases", giving off both hydrogen and oxygen. Because hydrogen is easily ignited in concentrations ranging from 4 percent to 75 per cent in air, battery containers and compartments should be kept adequately ventilated to prevent an accumulation of dangerous gas.

21.15.2 Smoking and any type of naked flames should be prohibited in a battery compartment. A conspicuous notice to this effect should be displayed at the entrance to the compartment.

21.15.3 Lighting fittings in battery compartments should be properly maintained at all times, with protective glasses in position and properly tightened. If cracked or broken glasses cannot be replaced immediately, the electric circuit should be isolated until replacements are obtained.

21.15.4 No unauthorised modifications or additions should be made to electrical equipment (including lighting fittings) in battery compartments.

21.15.5 Portable electric lamps and tools, and other portable power tools which might give rise to sparks should not be used in battery compartments.

21.15.6 The battery compartment should not be used as a store for any materials or gear not associated.

21.15.7 A short circuit of even one cell may produce an arc or sparks which may cause an explosion of any hydrogen present. Additionally, the very heavy current which can flow in the short circuiting wire or tool may cause burns due to rapid overheating of the metal.

21.15.8 Insulation and/or guarding of cables in battery compartments should be maintained in good condition.

21.15.9 All battery connections should be kept clean and tight to avoid sparking and overheating. Temporary clip-on connections should never be used as they may be worked loose due to vibration and cause a spark or short circuit.

21.15.10 Metal tools, such as wrenches or spanners, should never be placed on top of batteries as they may cause sparks or short circuits. The use of insulated tools is recommended.

21.15.11 Jewellery, watches and rings etc. should be removed when working on batteries. A short circuit through any of these items will heat it rapidly and may cause a severe skin burn. If rings cannot be removed, they should be heavily taped in insulating material.

21.15.12 The battery chargers and all circuits fed by the battery should be switched off when leads are being connected or disconnected. If a battery is in sections, it may be possible to reduce the voltage between cells in the work area, and hence the severity of an accidental short circuit or electric shock, by removing the jumper leads between sections before work is begun. It should be appreciated that whilst individual cell voltages may not prevent a shock risk, dangerous voltages can exist when numbers of cells are connected together in a series. A lethal shock needs a current of only tens of milliamps and particular care should be exercised when the voltage exceeds 50V.

21.15.13 Battery cell vent plugs should be screwed tight while connections are being made or broken.

21.15.14 The ventilation tubes of battery boxes should be examined regularly to ensure that they are free from obstruction.

21.15.15 Lids of battery boxes should be fastened while open for servicing and properly secured again when the work is finished.

21.15.16 Batteries should be kept battened into position to prevent shifting in rough weather.

21.15.17 Alkaline and lead-acid batteries should be kept in separate compartments or separated by screens. Where both lead-acid and alkaline batteries are in use, great care should be exercised to keep apart the materials and tools used in servicing each type, as contamination of the electrolyte may cause deterioration of battery performance and mixing of the two electrolytes produce a vigorous chemical reaction which could be very dangerous.

21.15.18 Both acid and alkaline electrolytes are highly corrosive. Immediate remedial action should be taken to wash off any accidental splashes on the person or on the equipment. Hands should always be washed as soon as the work is finished.

21.15.19 Batteries should always be transported in the upright position to avoid spillage of electrolyte. A sufficient number of men should be employed since the batteries are heavy and painful strains or injury can otherwise easily result (see Chapter 18).

21.16 Storage batteries - lead acid

21.16.1 When the electrolyte is being prepared, the concentrated sulphuric acid should be added SLOWLY to the water. IF WATER IS ADDED TO THE ACID, THE HEAT GENERATED MAY CAUSE AN EXPLOSION OF STEAM, SPLATTERING ACID OVER THE PERSON HANDLING IT.

21.16.2 Goggles, rubber gloves and protective apron should be worn when acid is handled.

21.16.3 To neutralise acid on skin or clothes, copious quantities of clean fresh water should be used.

21.16.4 An eyewash bottle should be to hand in the compartment for immediate use on the eyes in case of accident. This bottle should be clearly distinguishable from acid or other containers, by touch, so that it may be easily located by a person who is temporarily blinded.

21.16.5 The corrosion products which form round the terminals of batteries are injurious to skin or eyes. They should be removed by brushing, away from the body. Terminals should be protected with petroleum jelly.

21.16.6 An excessive charging rate causes acid mist to be carried out of the vents on to adjacent surfaces. This should be cleaned off with diluted ammonia water or soda solution, and affected areas then dried.

21.17 Storage batteries - alkaline

21.17.1 The general safety precautions with this type of battery are the same as for the lead-acid batteries with the following exceptions.

21.17.2 The electrolyte in these batteries is alkaline but is similarly corrosive. It should not be allowed to come into contact with the skin or clothing, but in the case of accident the affected parts should be washed with plenty of clean fresh water. Burns should be treated with boracic powder or a saturated solution of boracic powder. Eyes should be washed out thoroughly with water followed immediately with a solution of boracic powder (at the rate of one teaspoonful to 1/2 litre or one pint of water). This solution should be always readily accessible when the electrolyte is handled.

21.17.3 Unlike lead-acid batteries, metal cases of alkaline batteries remain live at all times and care should be taken not to touch them or allow metal tools to come into contact.

21.18 Work on apparatus on extension runners or on the bench

21.18.1 Chassis on extension runners should be firmly fixed, either by self-locking devices or by use of chocks, before any work is done.

21.18.2 Where units are awkward or heavy for one person to handle easily, assistance should be sought (see Chapter 18). Strain, rupture or a slipped disc can result from a lone effort.

21.18.3 Any chassis on the bench should be firmly wedged or otherwise secured to prevent it overbalancing or moving. Should a live chassis overbalance, no attempt should be made to grab it.

21.18.4 Temporary connections should be made sound. Flexible extension cables should have good insulation and adequate current carrying capacity.

21.19 Servicing radio and associated electronic equipment - general

21.19.1 Any precautions against exposure to dangerous levels of microwave radiation recommended by manufacturers should be strictly followed. Radar sets should generally not be operated with wave guides disconnected. However, if it is necessary for servicing purposes, special precautions should be taken.

21.19.2 Work should not be taken within the marked safety radius of a Satellite Terminal Antenna unless its transmitter has been rendered inoperative.

21.19.3 Eyes are particularly vulnerable to microwave and ultraviolet radiation. Care should be taken to avoid looking directly into a radar aerial and waveguide while it is in operation or where arcing or sparking is likely to occur.

21.19.4 Exposure to dangerous levels of X-ray radiation may occur in the vicinity of faulty high voltage valves. Care should be exercised when fault tracing in the modulator circuits of radar equipment. An open circuited heater of such valves can lead to X-ray radiation where the anode voltage is in excess of 5000V.

21.19.5 Vapours of some solvents used for degreasing are toxic, particularly carbon tetrachloride which should never be used. Great care should be exercised when using solvents particularly in confined spaces; there should be no smoking. Manufacturer's instructions should be followed.

21.19.6 Some dry recorder papers used in facsimile recorders give off toxic fumes in use. The equipment should be well ventilated to avoid inhalation of the fumes.

21.19.7 Radio transmitters and radar equipment should not be operated when men are working in the vicinity of aerials; the equipment should be isolated from mains supply and radio transmitters earthed. When equipment has been isolated, warning notices should be placed on transmitting and radar equipment and at the mains supply point, to prevent apparatus being switched on until clearance has been received from those concerned that they have finished the outside work.

21.19.8 Aerials should be rigged out of reach of personnel standing at normal deck level or mounting easily accessible parts of the superstructure. If that is impracticable, safety screens should be erected.

21.19.9 Notices warning of the danger of high voltage should be displayed near radio transmitter aerials and lead-through insulators.

21.20 Additional electrical hazards from radio equipment

21.20.1 Where accumulators are used they should be disconnected at source; otherwise precautions should be taken to prevent short circuiting the accumulator with consequent risk of burns.

21.20.2 Live chassis connected to one side of the mains are usually marked appropriately and should be handled with caution. Where the mains are AC and a transformer is

interposed, the chassis is usually connected to the earth side of the supply, but this should be verified using an appropriate meter.

21.20.3 Modern equipment often embodies a master crystal enclosed in an oven; the supply to the oven is taken from an independent source and is not disconnected when the transmitter is switched off and the mains switch is off. Mains voltage will be present inside the transmitter, and care should be taken.

21.20.4 Before work is begun on the EHT section of a transmitter or other HT apparatus, with the mains switched off, all HT capacitors should be discharged using an insulated jumper, inserting a resistor in the circuit to slow the rate of discharge. This precaution should be taken even where the capacitors have permanent discharge resistors fitted.

21.20.5 An electrolyte capacitor that is suspect, or shows blistering, should be replaced, since it is liable to explode when electrical supply is on. There is a similar risk when a electrolyte capacitor is discharged by a short circuit.

21.20.6 Work at or near live equipment should be avoided if possible but where it is essential for the safety of the ship or for testing purposes then the additional precautions described in 21.11.6 should be taken.

21.21 Valves and semi-conductor devices

21.21.1 Valves being removed from equipment which has recently been operating should be grasped with a heat resistant cloth; in case of large valves, e.g. power amplifier, OP and modulators, which reach a high temperature in operation, cooling down time should be allowed before they are removed. Severe burns can result if they touch bare skin.

21.21.2 Cathode ray tubes and large thermionic valves should be handled with care; although they implode when broken, there is still a risk of severe cuts from sharp-edged glass fragments. Some special purpose devices contain vapour or gas at high pressure, for example Trigatron, but these are usually covered with a protective fibre network to contain the glass should they explode.

21.21.3 Beryllia (berylim oxide) dust is very dangerous if inhaled or if it penetrates the skin through a cut or abrasion. It may be present in some electronic components. Cathode ray tubes, power transistors, diodes and thyristors containing it will usually be identified by the manufacturer's information provided, but lack of such information should not be taken as a positive indication of its absence. Those heat sink washers which contain it are highly polished and look like dark brass. These items should be carefully stored in their original packaging until required.

21.21.4 Physical damage to components of this kind whether they are new or defective is likely to produce dangerous dust; abrasion should be avoided, they should not be worked by tools and encapsulations should be left intact. Excessive heat can be dangerous, but normal soldering with thermal shunt is safe. Damaged or broken parts should be separately and securely packed, following the manufacturer's instructions for return or disposal.

21.21.5 Personnel handling parts containing beryllia should wear protective clothing, including gloves, to prevent beryllia coming into contact with the skin. Tweezers should

be used where practicable. If the skin does become contaminated with the dust, affected parts, particularly any cuts, should be cleaned without delay.

Chapter 22 - Hot Work

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

22.1 Introduction

22.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of hot work.

22.2 General

22.2.1 Welding and flame-cutting elsewhere than in the workshop should generally be the subject of a "permit-to-work" (see Chapter 15).

22.2.2 Operators should be competent in the process, familiar with the equipment to be used and instructed where special precautions need to be taken.

22.2.3 Where portable lights are needed to provide adequate illumination, they should be clamped or otherwise secured in position, not hand-held, with leads kept clear of the working area.

22.2.4 Harmful fumes can be produced during these operations from galvanising paint and other protective materials. Oxygen in the atmosphere can be depleted when using gas cutting equipment and noxious gases may be produced when welding or cutting. Special care should therefore be taken when welding and flame-cutting in enclosed spaces to provide adequate ventilation. The effectiveness of the ventilation should be checked at intervals while the work is in progress, and if appropriate local exhaust ventilation should be considered. In confined spaces, breathing apparatus may be required.

22.2.5 Suggested procedures for lighting up and shutting down are at Annex 22.1.

22.3 Personal Protective Equipment

22.3.1 Personal protective equipment complying with CYS EN 470-1: 1995 standard (see appendix 1) specifications or their equivalent must be worn by the operator and as appropriate by those assisting with the operation to protect them from particles of hot metal and slag, and their eyes and skin from ultra-violet and heat radiation.

22.3.2 The operator should normally wear:

(a) Welding shields or welding goggles with appropriate shade of filter lens to CYS EN 169:2002 standard (see appendix 1). Goggles are only recommended for gas welding and flame cutting;

(b) leather gauntlets;

(c) leather apron (in appropriate circumstances);

(d) long-sleeved natural fibre boiler suit or other approved protective clothing.

22.3.3 Clothing should be free of grease and oil and other flammable substances.

22.4 Pre-use equipment check

22.4.1 Welding and flame-cutting equipment should be inspected before use by a competent person to ensure that it is in a serviceable condition.

22.4.2 In cold weather moisture trapped in the equipment may freeze and, for example, cause valves to malfunction. It is recommended that equipment is thawed out with hot water and cloths, never with naked flames.

22.5 Precautions against fire and explosion

22.5.1 Before welding, flame-cutting or other hot work is begun, a check should be made that there are no combustible solids, liquids or gases, at, below or adjacent to the area or work, which might be ignited by heat or sparks from the work. Such work should never be undertaken on surfaces covered with grease, oil or other flammable or combustible materials. Where necessary, combustible materials and dunnage should be moved to a safe distance before commencing operations. Such places should also be free of materials which could release flammable substance for example if disturbed.

22.5.2 When welding is to be done in the vicinity of open hatches, suitable screens should be erected to prevent sparks from dropping down in the hatchways or in the hold ventilators.

22.5.3 Port holes and other openings through which sparks may fall should be closed where practicable.

22.5.4 Where work is being done close to or at bulkheads, decks or deckheads, the far side of the divisions should be checked for materials and substances which may ignite, and for cables, pipelines or other services which may be affected by the heat.

22.5.5 Cargo tanks, fuel tanks, cargo holds, pipelines, pumps and other spaces, that had contained flammable substances, should be certified as being free of flammable gases before any repair work is commenced. The testing should include, as appropriate, the testing of adjacent spaces, double bottoms, cofferdams etc. Further tests should be carried out at regular intervals and before hot work is recommenced following any suspension of the work. When preparing tankers and similar ships all tanks, cargo pumps and pipelines should be thoroughly cleaned and particular care taken with the draining and cleaning of pipelines that cannot be directly flushed using the ship pumps.

22.5.6 Welding and flame-cutting operations should be properly supervised and kept under regular observation. Suitable fire extinguishers should be kept at hand ready for use during the operation. A person with a suitable extinguisher should also be stationed to keep watch on areas not visible to the welder which may be affected.

22.5.7 In view of the risk of delayed fires resulting from the use of burning or welding apparatus, frequent checks should be made for at least two hours after the work has stopped.

22.6 Electric welding equipment

22.6.1 In order to minimise personal harm from electric shock, electric welding power sources for shipboard use should have a direct current (DC) output not exceeding 70V, with a minimum ripple. Further information on DC power sources is given in 22.6.11.

22.6.2 When DC equipment is not available, then AC output power sources may be used provided they have an integral voltage limiting device to ensure that the idling voltage (the voltage between electrode and work piece before an arc is struck between them) does not exceed 25V rms. The proper function of the device (which may be affected by dust or humidity) should be checked each time a welding set is used. Some voltage limiting devices are affected by their angle of tilt from the vertical, so it is important that they are mounted and used in the position specified by the manufacturers. This requirement can be affected by adverse sea conditions.

22.6.3 A “go-and-return” system utilising two cables from the welding set should be adopted the welding return cable should be firmly clamped to the workpiece.

22.6.4 Earthing of the workpiece is used to provide protection against internal insulation failure of the welding transformer, by keeping the workpiece at or near earth potential until the protective device (e.g. a fuse) operates to cut off the main supply. Where the welding circuit is not adequately insulated from the earthed referenced mains supply, (i.e. not constructed to one of the standards listed in Annex 22.2) the workpiece should be earthed. The “return” cable of the welding set and each workpiece should be separately earthed to the ship’s structure. The use of a single cable with hull return is not recommended. The workpiece earthing conductor should be robust enough to withstand possible mechanical damage and should be connected to the workpiece and a suitable earth terminal by bolted lugs or secure screw clamps.

Note: Some manufacturers may recommend earthing as one of their measures to reduce the electrical interference. This is not a safety related measure, but the manufacturers' advice should be followed.

22.6.5 If an alternative method of protecting against welding transformer insulation failure is used, the hazards caused by stray welding currents can be avoided by not earthing the workpiece or the welding output circuit. Self-contained engine-driven welding sets, and welding power sources which comply with the standards listed in Annex 22.2 do not need the workpiece to be earthed. It should be noted, however, that other equipment connected to the workpiece may require earthing for safe operation (e.g. welding sets not constructed to one of the standards listed in Annex 22.2 or electrical pre-heating systems).

22.6.6 To avoid voltage drop in transmission, the lead and return cables should be of the minimum length practicable for the job and of an appropriate cross-section.

22.6.7 Cables should be inspected before use; if the insulation is impaired or conductively reduced, they should not be used.

22.6.8 Cable connectors should be fully insulated when connected, and so designed and installed that current carrying parts are adequately recessed when disconnected.

22.6.9 Electrode holders should be fully insulated so that no live part of the holder is exposed to touch, and, where practicable, should be fitted with guards to prevent accidental contact with live electrodes and as protection from sparks and splashes of weld metal.

22.6.10 A local switching arrangement or other suitable means should be provided for rapidly cutting off current from the electrode should the operator get into difficulties and also for isolating the holder when electrodes are changed.

22.6.11 The direct current output from power sources should not exceed 70 volts open circuit. The ripple on the output from the power source should not exceed the values of the table below. The ripple magnitudes are expressed as percentages of the DC, and the ripple peak is that with the same polarity as the DC.

Ripple Frequency, Hz	**50/60**	**300**	**1100**	**2400**
Max. RMS O/C voltage ripple, (%)	5	6	8	10
Max. peak O/C voltage ripple, (%)	10	11	16	20

22.6.12 The conditions in the table 22.6.11 are normally met by DC generators incorporating commutators and by rectifier power sources having a 3 phase bridge rectifier operating from a 3 phase 50/60 Hz supply. Rectifier power sources should not be operated from a power supply of less than 50 Hz.

22.6.13 Should it be necessary to use a power source with a DC output having a ripple magnitude in excess of those stated in the table, for example a single phase rectifier

power source, then a voltage limiting device should be incorporated in the power source to ensure that the idling voltage does not exceed 42V.

22.7 Precautions to be taken during electric arc welding

22.7.1 In addition to the protective clothing specified in 22.3.2 the welding operator should wear non-conducting safety footwear complying with ISO 2024:1981 standard (see appendix 1). Clothing should be kept as dry as possible as some protection against electric shock; it is particularly important that gloves should be dry as wet leather is a good conductor.

22.7.2 An assistant should be in continuous attendance during welding operations, who should be alert to the risk of accidental shock to the welder, and ready to cut off power instantly, raise the alarm and provide artificial respiration without delay. It may be desirable to have a second assistant if the work is to be carried out in difficult conditions.

22.7.3 Where persons other than the operator are likely to be exposed to harmful radiation or sparks from electric arc welding, they should be protected by screens or other effective means.

22.7.4 In restricted spaces, where the operator may be in close contact with the ship's structure or is likely to make contact in the course of ordinary movements, protection should be provided by dry insulating mats or boards.

22.7.5 There are increased risks of electric shock to the operator if welding is done in hot or humid conditions; body sweat and damp clothing greatly reduce body resistance. Under such conditions, the operation should be deferred until such time that an adequate level of safety can be achieved.

22.7.6 In no circumstances should a welder work while standing in water or with any part of their body immersed.

22.7.7 The electrode holder should be isolated from the current supply before a used electrode is removed and before anew electrode is inserted. This precaution is necessary because some electrode coatings have extremely low resistance. Even a flux coating which is normally insulating can become damp from sweating hands and thus potentially dangerous.

22.7.8 When the welding operation is completed or temporarily suspended, the electrode should be removed from the holder.

22.7.9 Hot electrode ends should be ejected into a suitable container; they should not be handled with bare hands.

22.7.10 Spare electrodes should be kept dry in their container until required for use.

22.8 Compressed gas cylinders

22.8.1 Compressed gas cylinders should always be handled with care, whether full or empty. They should be properly secured and kept upright. The cylinders should be so secured as to be capable of quick and easy release, for example, in the case of fire. If available, cylinder trolleys should be used to transport cylinders from one place to another.

22.8.2 The protective caps over the valve should be screwed in place when the cylinders are not in use or are being moved. Valves should be closed when the cylinder is empty.

22.8.3 Where two or more cylinders of either oxygen or a fuel gas (such as acetylene) are carried the oxygen and the fuel gas should be stowed in separate, well-ventilated compartments that are not subject to extremes of temperature. The space in which acetylene or other fuel gas cylinders are stowed should have no electrical fittings or other sources of ignition and prominent and permanent “NO SMOKING” signs should be displayed in the entrance and within the space. Empty cylinders should be segregated from the full ones and so marked.

22.8.4 The following special precautions need to be taken in the case of cylinders of oxygen and acetylene or other fuel gases:

(a) Cylinders valves, controls and associated fittings should be kept free from oil, grease and paint; controls should not be operated with oily hands;

(b) gas should not be taken from such cylinders unless the correct pressure reducing regulator has been attached to the cylinder outlet valve;

(c) cylinders found to have leaks that cannot be stopped by closing the outlet valve should be taken to the open deck away from any sources of heat or ignition and slowly discharged to the atmosphere.

22.8.5 Identifying marks on cylinders are set out in Chapter 27.5.

22.9 Gas Welding and Cutting

22.9.1 While this section deals almost exclusively with oxygen and acetylene, other fuel gases may be used and similar precautions should be taken.

22.9.2 The pressure of oxygen used for welding should always be high enough to prevent acetylene flowing back into the oxygen line.

22.9.3 Acetylene should not be used for welding at a pressure exceeding 1 atmosphere gauge as it is liable to explode, even in the absence of air, when under excessive pressure.

22.9.4 Non-return valves should be fitted adjacent to the torch in the oxygen and acetylene supply lines.

22.9.5 Flame arrestors should be provided in the oxygen and acetylene supply lines and will usually be fitted at the low pressure side of regulators although they may be duplicated at the torch.

22.9.6 Should a backfire occur (i.e. the flame returns into the blowpipe and continues burning in the neck or mixing chamber) the recommended first action is to close the oxygen valve on the blowpipe – to prevent internal burning – followed immediately by shutting off the fuel gas at the blowpipe valve. Items 3-6 of the shutting down procedure in Annex 22.1 may then be followed. When the cause of the backfire has been discovered, the fault rectified and the blowpipe cooled down, the blowpipe may be re-lit.

22.9.7 If there is a flashback into the hose and equipment, or a hose fire or explosion, or a fire at the regulator connections or gas supply outlet points, the first action should be to isolate the oxygen and fuel gas supplies at the cylinder valves or gas supply outlet points – but only if this can be done safely. Further action should follow in accordance with the vessel's fire drill requirements.

22.9.8 A watch should be kept on acetylene cylinders to ensure they are not becoming hot. If they are, this could be a sign of acetylene decomposition and there is increased risk of explosion. The cylinder stop valve should be closed immediately, which may limit or reduce the decomposition but is unlikely to stop it. Emergency action, such as evacuating the area and prolonged cooling by immersion or with copious amounts of water will still be required. Consideration should be given to jettisoning the cylinder overboard although movement of the cylinder can promote rapid decomposition, and cooling should continue while it is being moved. Any acetylene cylinder suspected of overheating should be approached with extreme caution because an impact could set off an internal ignition which might cause an explosion.

22.9.9 Only acetylene cylinders of approximately equal pressures should be coupled.

22.9.10 In fixed installations, manifolds should be clearly marked with the gas they contain.

22.9.11 Manifold hose connections including inlet and outlet connections should be such that the hose cannot be interchanged between fuel gases and oxygen manifolds and headers.

22.9.12 Only those hoses specially designed for welding and cutting operations should be used to connect any oxy-acetylene blowpipe to gas outlets.

22.9.13 Any length of hose in which a flashback has occurred should be discarded.

22.9.14 The connections between hose and blowpipe, and between hoses should be securely fixed with fittings which comply with CYS EN 1256:1996 standard (see appendix 1). More detailed guidance on hose connections and assemblies is given in Annex 22.3.

22.9.15 Hoses should be arranged so that they are not likely to become kinked or tangled or be tripped over, cut or otherwise damaged by moving objects or falling metal slag, sparks etc.; a sudden jerk or pull on the hose is liable to pull the blowpipe out of the operator's hands or cause a cylinder to fall or a hose connection to fail. Hoses in passageways should be covered to avoid them becoming a tripping hazard.

22.9.16 Soapy water should be used for testing leaks in hoses. If there are leaks which cannot easily be stopped, the gas supply should be isolated and the leaking components taken out of service, replaced or repaired. If the leak is at a cylinder valve or pressure regulator ("bull-nose") connection, the cylinder should be removed to a safe place in the open air. If it is a fuel-gas cylinder, it should be taken well clear of any source of ignition.

22.9.17 Excessive force should never be used on cylinder valve spindles or hexagon nuts of regulator connections in an attempt to stop a leak. Neither are sealing tape nor other jointing materials recommended for use in an attempt to prevent leaks between metal-metal surfaces that are designed to be gas tight. With an oxygen cylinder this could result in initiation of a metal-oxygen fire.

22.9.18 Blowpipes should be lit with a special friction igniter, stationary pilot flame or other safe means.

22.9.19 Should a blowpipe-tip opening become clogged, it should be cleaned only with the tools especially designed for that purpose.

22.9.20 When a blowpipe is to be changed the gases should be shut off at the pressure-reducing regulators.

22.9.21 To prevent a build-up of dangerous concentrations of gas or fumes during a temporary stoppage or after completion of the work, supply valves on gas cylinders and gas mains should be securely closed and blowpipes, hoses and moveable pipes should be removed to lockers that open on to the open deck.

22.9.22 Oxygen should never be used to ventilate, cool or blow dust off clothing (see also Section 19.7).

ANNEX 22.1

HOT WORK, LIGHTING UP AND SHUTTING DOWN PROCEDURES

These procedures are appropriate for oxy-fuel gas equipment and, with little modification, also for air-aspirated blowpipes.

Lighting up

1. Ensure that the pre-use equipment checks have been made.

2. Check that the outlets of adjustable pressure regulators are closed, i.e. that the pressure-adjusting screw of the regulator is in the fully unwound (anti-clockwise) position.

3. Check that the blowpipe valves are closed.

4. Slowly open the cylinder valves (or gas supply point isolation valves) – to avoid sudden pressurisation of any equipment.

5. Adjust pressure regulators to the correct outlet pressures. Or, check that the pressures in distribution pipework are suitable for the equipment and process.

6. Open the oxygen valve at the blowpipe and allow the flow of oxygen to purge* air out of oxygen hose and equipment, if necessary, reset the pressure regulator to ensure correct working oxygen pressure.

7. Close the oxygen valve at the blowpipe.

8. Open the fuel gas valve at the blowpipe and allow the gas flow to purge* air or oxygen from the fuel gas hose and equipment, if necessary, reset the pressure regulator to ensure correct working fuel gas pressure.

9. Light the fuel gas immediately, and preferably with a spark lighter.

10. Open the oxygen valve at the blowpipe and adjust it and the fuel gas valve to give the correct flame setting.

***** Purging is important, it removes flammable gas mixtures from the hoses and equipment which could result in explosions and fires when the blowpipe is first lit. It should be carried out in a well-ventilated area, and it may take from several seconds to a minute or more depending on the length of the hose and gas flow rates.

Shutting down

1. Close the fuel gas valve at the blowpipe.

2. Immediately close the oxygen valve at the blowpipe.

3.*Close the cylinder valves or gas supply point isolation valves for both oxygen and fuel gas.

4. Close the outlets of adjustable pressure regulators by winding out the pressure-adjusting screws.

5. Open both blowpipe valves to vent the pressure in the equipment.

6. Close the blowpipe valves.

***** Step 3 is not necessary when the equipment is to be used again in the immediate future.

ANNEX 22.2

EARTHING OF ARC WELDING SYSTEMS

TRANSFORMER CASING

Earthed Class I Appliance

Not earthed Class II Appliance

TRANSFORMER SECONDARY

Earthed
This is an obsolete type of equipment and should be taken out of service. Failure of the weld return connection might not be noticed, and damage to other earthed metallic paths could result.

Isolated
The absence of a weld return conductor will prevent welding being carried out. However a failure of isolation within the welding set could cause the work item to become live. For this reason the workpiece should be earthed.

Isolated with double or reinforced insulation

This is the most important standard to which equipment is being built. Because of the strengthened insulation, the workpiece need not be earthed. Furthermore, to prevent the possibility of stray weld return currents in the supply system earth conductors, it is recommended that the workpiece is not earthed. Such welding power sources may be identified by the additional symbol if made to the relevant parts of CYS EN 60974 - 1:1998 standard (see appendix 1), or they will be marked with the standards numbers CYS EN 50060 or IEC974.

ANNEX 22.3.

HOT WORK, HOSES AND CONNECTIONS/ASSEMBLIES

Hoses

Rubber hoses complying with CYS EN 559: 1994 standard (see appendix 1) are recommended for use in gas welding and cutting processes, which are often carried out in aggressive working environments. Hoses satisfying these standards are reinforced with an outer protective cover designed to be resistant to hot surfaces, molten slag or sparks, and made with linings that resist the action of hydrocarbons (for LPG hoses) acetone or dimethyl formamide (for acetylene hoses) and ignition in an atmosphere of oxygen (for all services). Burst pressure is 60 bar and maximum working pressure 20 bar.

Hoses meeting the requirements of BS 3212:1991 standard (see appendix 1) or equivalent are recommended for LPG vapour-phase applications other than welding or cutting. Hose made of thermoplastics materials is not generally suitable for welding and cutting,

because it does not have the same resistance to hot surfaces or hot particles as reinforced rubber hose.

Connections

Hose connections (comprising hose nipples and "bull nose" hose connections) should comply with CYS EN 1256 standard (see appendix 1). Thread sizes specified in these standards are based on Whitworth dimensions which are generally used in this field in many countries. Right-hand threads are used for oxygen and non-combustible gases; left-hand threads are used for fuel gases, with the hexagon nuts on their union connections notched to aid identification.

Hose connections may also be made with a quick-action coupling – a male probe fitted to the end of the hose and a female connector with a self-sealing valve usually fitted to a fixed piece of equipment or gas supply outlet point. The probe is pushed into the female fitting where it locks in position and automatically opens the internal valve. Connections of this type are simple and quick to operate and there is no need to use a spanner to tighten any nuts.

Problems are that the male probe may become damaged (e.g. from being dragged along the ground or over-use and cause the coupling to leak, and there is a possibility of connecting the hose to the wrong gas outlet). Both should be avoided if couplings comply with CYS EN 561:1995 standard (see appendix). These require hard material of construction to be used for the probes, and their design dimensions are intended to prevent interchangeability between oxygen and fuel gas connections.

Hose assemblies

Hose lengths are usually supplied in Cyprus as pre-assembled units complete with connection fittings crimped to the ends of the hose. Hose and hose nipple dimensions are matched by the supplier to ensure a good fit. The recommended standard for hose assemblies is CYS EN 1256: 1996 (see appendix 1), which specifies requirements for leak tightness and resistance to axial loading. Worm drive or similar clips are not recommended for fastening hoses.

Chapter 23 - Painting

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

23.1 Introduction

23.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of painting.

23.2 General

23.2.1 Paints may contain toxic or irritant substances, and the solvents may give rise to flammable and potentially explosive vapours, which may also be toxic. Personnel using such paints should be warned of the particular risks arising from their use. Paints containing organic pesticides can be particularly dangerous. If the manufacturer's instructions are not given on the container, information should be obtained at the time of supply about any special hazards, and also whether special methods of application should be followed. Such advice should be readily available at the time of use but the following precautions should always be taken.

23.3 Preparation and Precautions

23.3.1 Painted surfaces should always be rubbed down wet to reduce dust from the old paint, which may be toxic if inhaled. Where the dust is known to contain lead, other dust treating methods should be used. Dust masks should be worn as protection against other dusts.

23.3.2 If the surface to be rubbed down is known to contain lead, then methods that do not create dust should be adopted. It is safe to avoid or minimise dust creation than to try to clean up the dust afterwards. Sanding or abrasive blasting should be avoided. Lead based paint should never be burnt off as fumes will contain metallic lead in a readily absorbed form.

23.3.3 Rust removers are acids and contact with unprotected skin should be avoided. Eye protection should be worn against splashes (see Chapter 4.7). If painting aloft or otherwise near ropes, care should be taken to avoid splashes on ropes, safety harnesses, lines etc. (see Chapter 19.9 on the effect of such contamination on ropes).

23.3.4 Interior and enclosed spaces should be well ventilated, both while painting is in progress and until the paint has dried.

23.3.5 There should be no smoking or use of naked lights in interior spaces during painting or until the paint has dried hard. Some vapours even in low concentrations may decompose into more harmful substances when passing through burning tobacco.

23.3.6 When painting is done in the vicinity of machinery or from an overhead crane gantry, the power supply should be isolated and the machine immobilised in such a way that it cannot be moved or started up inadvertently. Appropriate warning notices should be posted (see 21.11.3). Close-fitting clothing should be worn.

23.4 Use of Paint Spraying Equipment

23.4.1 As there are many different types of paint spraying equipment in use, operatives should comply with the manufacturers' instructions for use.

23.4.2 Airless spray-painting equipment is particularly hazardous since the paint is ejected at a very high pressure and can penetrate the skin or cause serious eye injuries. Spray should not be allowed to come into contact with the face or unprotected skin.

23.4.3 Suitable protective clothing such as a combination suit, gloves, cloth hood and eye protection should be worn during spraying.

23.4.4 Paints containing lead, mercury or similarly toxic compounds should not be sprayed in interiors.

23.4.5 A suitable respirator should be worn according to the nature of the paint being sprayed. In exceptional circumstances it may be necessary to use breathing apparatus (see Chapter 4.8).

23.4.6 If a spray nozzle clogs, the trigger of the gun should be locked in a closed position before any attempt is made to clear the blockage.

23.4.7 Before a blocked spray nozzle is removed or any other dismantling is attempted, pressure should be relieved from the system.

23.4.8 When blowing through a reversible nozzle to remove a blockage, all parts of the body should be kept clear of the nozzle mouth.

23.4.9 The pressure in the system should not exceed the recommended working pressure of the hose. The system should be regularly inspected for defects.

23.4.10 As an additional precaution against the hazards of a hose bursting, a loose sleeve, for example a length of 2 to 3 meters (6 to 10 feet) of old air hose, may be slipped over that portion of the line adjacent to the gun and paint container.

Chapter 24 - Anchoring, Mooring and Towing Operations

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

24.1 Introduction

24.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of anchoring, mooring and towing operations. It is particularly important that the risk assessment considers the consequences of the failure of any element of the equipment.

24.2 Anchoring and Weighing Anchor

24.2.1 Before using an anchor a competent seafarer should check that the brakes are securely on and then clear voyage securing devices. A responsible person should be in charge of the anchoring team, with an adequate communications system with the vessel's bridge. The anchoring party should wear appropriate safety clothing – safety helmets, safety shoes and goggles as a minimum protection from injury from dirt, rust particles and debris which may be thrown off during the operation. Wherever possible, they should stand aft of the windlass.

24.2.2 Where the means of communication between bridge and anchoring party is by portable radio, the identification of the ship should be clear to avoid misinterpretation of instructions from other users of such equipment.

24.2.3 Before anchors are let go, a check should be made that no small craft or other obstacle is under the bow. As a safety precaution it is recommended that the anchor is "walked out" clear of the pipe before letting go. For very large ships with heavy anchors and chains, the anchor should be walked out all the way to avoid excessive load on the brakes (and on the bitter end if the brakes fail to stop the anchor and chain).

24.2.4 Where the anchor is let go from the stowed position, if upon release of the brake, the anchor does not run, personnel should NOT attempt to shake the cable, but the brake should be re-applied, the windlass placed in gear, and the anchor walked out clear prior to release.

24.2.5 Anchor chain should stow automatically. If, for any reason, it is necessary for personnel to enter the chain locker, they should stand in a protected position and, as far as possible, have constant communication with the windlass operator.

24.2.6 Anchors housed and not required should be properly secured to prevent accidental release.

24.3 Making Fast and Casting Off

24.3.1 During mooring and un-mooring operations a sufficient number of personnel should always be available at each end of the vessel to ensure a safe operation. A responsible officer should be in charge of each of the mooring parties, and a suitable means of communication between the responsible officers and the vessel's bridge team should be established. If this should involve use of portable radio, then the ship should be clearly identified by name to prevent misinterpretation. All personnel involved in such operations should wear suitable protective clothing (see Chapter 4).

24.3.2 Vessels' heaving lines should be constructed with a "monkey's fist" at one end. To prevent personal injury, the "fist" should be made only with rope and should not contain added weighting material.

24.3.3 Areas where mooring operations are to be undertaken should be clutter free as far as possible. Decks should have anti-slip surfaces provided by fixed treads or anti-slip paint coating, and the whole working area should be adequately lit for operations undertaken during periods of darkness.

24.3.4 All equipment used in mooring operations should be regularly inspected for defects. Any defects found should be corrected as soon as possible. Particular attention should be paid to the risk of oil leaks from winches, and surfaces of fairleads, bollards, bitts and drum ends should be clean and in good condition. Rollers and fairleads should turn smoothly and a visual check be made that corrosion has not weakened them.

24.3.5 Mooring ropes, wires and stoppers that are to be used in the operation should be in good condition. Ropes should be frequently inspected for both external wear and wear between strands. Wires should be regularly treated with suitable lubricants (see section 20.2.28) and inspected for deterioration internally and broken strands externally. Splices in both ropes and wires should be inspected regularly to check they are intact. Where wire rope is joined to fibre rope, a thimble or other device should be inserted in the eye of the fibre rope. Both wire and fibre rope should have the same direction of lay.

24.3.6 Ropes and wires which are stowed on reels should not be used directly from stowage, but should be run off and flaked out on deck in a clear and safe manner, ensuring sufficient slack to cover all contingencies. If there is doubt of the amount required, then the complete reel should be run off.

24.3.7 Careful thought should be given to the layout of moorings, so that leads are those most suited without creating sharp angles and ropes and wires are not fed through the same leads or bollards. Pre-planning of such operations is recommended.

24.3.8 Personnel should not in any circumstances stand in a bight of rope or wire. Operation of winches should preferably be undertaken by competent personnel to ensure that excessive loads do not arise on moorings.

24.3.9 When moorings are under strain all personnel in the vicinity should remain in positions of safety, i.e. avoiding all “snap-back” zones. Immediate action should be taken to reduce the load should any part of the system appear to be under excessive strain. Care is needed so that ropes or wires will not jam when they come under strain, so that if necessary they can quickly be slackened off.

24.3.10 Where moorings are to be heaved on a drum end, one person should be stationed at the drum end, backed up by a second person, packing and coiling down the slack. In most circumstances three turns on the drum end are sufficient to undertake a successful operation. A wire on a drum end should never be used as a check wire.

24.3.11 A wire should never be led across a fibre rope on a bollard. Wires and ropes should be kept in separate fairleads or bollards.

24.3.12 When stoppering off moorings the following applies:

(a) natural fibre rope should be stoppered with natural fibre;

(b) man made fibre rope should be stoppered with man made fibre stopper (but not polyamide);

(c) the method of double and reverse stoppering is preferable for ropes;

(d) Wire moorings should be stoppered with chain, using two half hitches in the form of a cow hitch, suitably spaced with the tail backed up against the lay of wire, to ensure that the chain neither jams nor opens up the lay of the wire.

24.4 Mooring to buoys

24.4.1 Where mooring to buoys is undertaken from a ship’s launch or boat, personnel engaged in the operation should wear lifejackets and a lifebuoy with attached lifeline should be kept readily available in the boat.

24.4.2 Means should be provided to enable a person who has fallen into the water to climb back on board the launch or boat. If a boarding ladder with flexible sides is used, it should be weighed so that the lower rungs remain below the surface of the water.

24.4.3 Where mooring to buoys is undertaken from the ship, a lifebuoy with attached line of sufficient length should be available for immediate use.

24.4.4 When slip wires are used for mooring to buoys or dolphins, the eyes of the wires should never be put over the bitts, as at the time of unmooring it may not be possible to release the load sufficiently to lift the eye clear. To prevent accidental slippage of the wire eye(s) over the bitts or other obstruction the eyes should be seized, partially closing the eye.

24.5 Towing

Guidance on port towage operations is given in Chapter 32

24.5.1 Equipment used for towing should be adequately maintained and inspected before use, as during towing operations excessive loads may be applied to ropes, wires, fairleads, bitts and connections.

24.5.2 Prior to towing operations being undertaken, the master should establish suitable means of communication, exchange relevant information (e.g. speed of vessel), and agree a plan for the tow with the tug master.

24.5.3 All personnel involved should be adequately briefed in their duties and in the safety precautions to be taken. They should be equipped with personal protective equipment including safety helmets and safety shoes.

24.5.4 Personnel should wherever possible agree with the tug crew the area where the heaving line is to be thrown, to allow them to move clear.

24.5.5 Once the tow is connected, non-essential personnel should keep clear of the operational area. If anyone is required to remain in this area or to attend to towing gear during the towing operation, they should take extreme care to keep clear of bights of wire or rope and the whiplash area should a line break. Exposure time should be kept to a minimum.

24.5.6 During operations, communications should be maintained between:

(a) The towing vessel and both the bridge team and the foredeck of the vessel under tow; and

(b) the tow party and the bridge team.

In all communications clear identification the parties communication should be used to prevent misunderstandings. The tug master should be kept informed of engine movements, proposed use of thrusts etc.

24.5.7 When letting go of a tow line, personnel should keep well clear of the tow eye, which should be lowered under the control of a messenger to reduce the risk of injury to those involved in the towing operation.

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Chapter 25 - Hatch Covers and Access Lids

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

25.1 Introduction

25.1.1 Based on the findings of the risk assessment, appropriate control measures should be put into place to protect those who may be affected. This Chapter highlights some areas which may require attention in respect of hatch covers and access lids.

25.2 General

25.2.1 Before vessel departure, weather deck hatch covers should be secured in the correct closed position. Whilst the vessel is at sea they should be regularly inspected to ensure that integrity is being maintained.

25.2.2 All hatch covers should be properly maintained. Defective or damaged covers should be replaced/repaired as soon as possible. All covers and beams should only be used if they are a good fit and overlap their end supports to an extent which is adequate but not excessive.

25.2.3 All personnel involved with the handling and/or operation of hatch covers must be properly instructed in their handling and operation. All stages of opening or closing hatches should be supervised by a responsible person. When hatches are open, the area around the opening and in the hatchways should be appropriately illuminated and guard-rails erected. Guard-rails should be tight with stanchions secured in position, and properly maintained. No hatch cover should be replaced contrary to information showing the correct replacement position.

25.2.4 Where lifting appliances are used, they should be attached to hatch covers from a safe position and without personnel being exposed to the danger of falling or being trapped.

25.2.5 No loads should be placed over, nor work take place on, any section of hatch cover unless it is known that the cover is properly secured and can safely support the load.

25.2.6 Partly opened unguarded hatches should never be covered with tarpaulins; this would present a serious hazard for any person walking across the hatch.

25.2.7 Hatch covers should not be used for any other purpose.

25.3 Mechanical hatch covers

25.3.1 The manufacturers' instructions for the safe operation, inspection, maintenance and repair of the type of mechanical hatch cover fitted should always be followed.

25.3.2 During operations, personnel should keep clear of the hatches and the cover stowage positions. The area should be kept clear of all items which might foul the covers or the handling equipment.

25.3.3 Special attention should be paid to the trim of the vessel when handling mechanical covers. The hatch locking pins or preventers of rolling hatch covers should not be removed until a check wire is fast to prevent premature rolling when the tracking is not horizontal.

25.3.4 Hatch wheels should be kept greased and free from dirt and the coaming runways and the drainage channels kept clean. The rubber sealing joints should be properly secured and be in good condition so as to provide a proper weathertight seal.

25.3.5 All locking and tightening devices should be secured in place on a closed hatch at all times when at sea. Securing cleats should be kept greased. Cleats, top-wedges and other tightening devices should be checked regularly whilst at sea.

25.3.6 Hatch covers should be properly secured immediately after closing or opening. They should be secured in the open position with chain preventers or by other suitable means. No one should climb on to any hatch cover unless it is properly secured.

25.4 Non-mechanical hatch covers and beams

25.4.1 Each non-mechanical hatchway should be provided with an appropriate number of properly fitting beams and hatch covers, pontoons or slab hatches adequately marked to show the correct replacement position, and with an adequate number of properly fitting tarpaulins, batten bars, side wedges and locking bars so that the hatch will remain secure and weathertight for all weather conditions.

25.4.2 Unless hatches are fitted with coamings to a height of at least 760 mm (30 inches) they should be securely covered or fenced to a height of 1 metre (39 inches) when not in use for the passage of cargo.

25.4.3 Manually handled hatch covers should be capable of being easily lifted by two people. Such hatch covers should be of adequate thickness and strength and provided with hand grips. Wooden hatch boards should be strengthened by steel bands at each end. One person should not attempt to handle hatch covers unaided unless the covers are designed for single-handed operation.

25.4.4 Hatch boards, hatch beams, pontoon hatches, hatch slabs and tarpaulins should be handled with care and properly stowed, stacked and secured so as not to endanger or impede the normal running of the vessel. Hatch boards should be removed working from the centre towards the sides, and replaced from the sides towards the centre. Personnel

hauling tarpaulins should walk forward and NOT backwards so that they can see where they are walking.

25.4.5 A derrick or crane should be used to handle beams. Pontoons or slab hatches should be positioned directly over them to lessen the risk of violent swinging once the weight has been taken.

25.4.6 Appropriate gear of adequate strength should be specially provided for the lifting of the beams, pontoons and slab hatches. Slings should be of adequate length, secured against accidental dislodgement while in use and fitted with control lanyards. The angle between arms of slings at the lifting point should not exceed 110º, in order to avoid undue stress. The winch or crane should be operated by a competent person under the direction of a ship's officer or other experienced person.

25.4.7 Beams and hatch covers remaining in position in a partly opened hatchway should be securely pinned, lashed, bolted or otherwise properly secured against accidental dislodgement.

25.4.8 Hatch covers and beams should not be removed or replaced until a check has been made that all persons are out of the hold or clear of the hatchway. Immediately before beams are to be removed, a check should be made that pins or other locking devices have been freed.

25.4.9 No one should walk out on a beam for any purpose.

25.4.10 Hatch covers should not be used in the construction of deck or cargo stages or have loads placed on them liable to damage them. Loads should not be placed on hatch coverings without the authority of a ship's officer.

25.5 Steel-hinged inspection/access lids

25.5.1 Inspection/access hatch lids should be constructed of steel or similar material, and hinged so that they can be easily and safely opened or closed. Those on weather decks should be seated on watertight rubber gaskets and secured weathertight by adequate dogs, side cleats or equivalent tightening devices.

25.5.2 When not secured, inspection/access hatch lids should be capable of being easily and safely opened from above and, if practicable, from below.

25.5.3 Adequate hand grips should be provided in accessible positions to lift inspection/access hatches by hand without straining or endangering personnel.

25.5.4 Heavy or inaccessible hatch lids should be fitted with counter-weights so that they can be opened by one or two persons. Where a counter-weight cannot be fitted due to inaccessibility, the hatch lids should be supplied with a purchase or pulley with eye-plates or ringbolts fitted in appropriate positions so that the hatch can be opened and closed without straining or endangering personnel.

25.5.5 The hatch lids when open should be easily and safely secured against movement or accidental closing. Adequate steel hooks or other means should be provided.

25.6 Access to Holds/Cargo spaces

25.6.1 Entry to holds/cargo spaces should only be undertaken on the authority of a responsible ships' officer, who should ensure prior to granting authority that the space has been adequately ventilated and, where appropriate, tested for noxious gases/oxygen content (see Chapter 16).

25.6.2 Entry should be made where at all possible through the permanent means of access. Where this is not possible, portable ladders may be used (see Chapter 14.3). When necessary, lifelines and safety harness should be available and used.

Chapter 26 - Hazardous Substances

Application to fishing vessels which operate outside territorial waters
This Chapter, except 26.4 and 26.6, applies to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

26.1 General Advice

26.1.1 Many substances found on ships are capable of damaging the health and safety of those exposed to them. They include not only substances containing hazard warning labels (e.g. dangerous goods cargoes and ships' stores) but also, for example, a range of dusts, fumes and fungal spores from goods, plant or activities aboard ship.

26.1.2 The employer's risk assessment will identify where personnel are working in the presence of substances hazardous to health and safety, and evaluate any risks from exposure (see Chapter 1). Appropriate measures should be taken to remove, control or minimise the risk (see section 26.2).

26.1.3 Employers should instruct and inform personnel so that they know and understand the risks arising from their work, the precautions to be taken and the results of any monitoring of exposure.

26.1.4 The risk assessment will also provide information to determine whether health surveillance is appropriate (see Chapter 2).

26.1.5 As an aid to the identification of hazards and the assessment of risks from dangerous goods reference may be made to the International Maritime Dangerous Goods Code or to the Chemical data sheets contained in the Tanker Safety Guides (Gas and Chemical) issued by the International Chamber of Shipping. Information concerning hazardous cargoes carried in bulk should be available where applicable to allow the assessment to be made.

26.1.6 In the case of ship's stores etc., reference should be made to the manufacturers' instructions and data sheets, which may be supplied with the goods.

26.2 Prevention or control of exposure

26.2.1 The first consideration should always be to prevent exposure by removing the substance, e.g. by substituting a less harmful one.

26.2.2 Where this is not reasonably practicable, prevention or control of exposure may be achieved by any combination of the following means:

(a) total or partial enclosure of the process and handling systems;

(b) use of plant, processes and systems of work which minimise the generation of, or suppress and contain, spills, leaks, dust fumes and vapour of hazardous substances;

(c) the limitation of the quantities of a substance at the place of work;

(d) keeping the number of persons who might be exposed to a substance to a minimum, and reducing the period of exposure;

(e) prohibiting eating, drinking and smoking in areas that may be contaminated by the substance;

(f) hygiene measures, including providing adequate washing and laundering facilities and regular cleaning of walls/bulkheads and other surfaces;

(g) the designation of those areas which may be contaminated and the use of suitable and sufficient warning signs; and

(h) the safe storage, handling and disposal of hazardous substances and use of closed and clearly labelled containers.

26.2.3 These measures should be applied to reduce the risk to personnel to the minimum, but where they do not adequately control the risk to health, personal protective equipment should be provided in addition.

26.2.4 Employers should take reasonable steps to ensure that any control measures are properly used and maintained. Where appropriate, exposure levels should be monitored and recorded.

26.2.5 Personnel should comply fully with the control measures in force.

26.2.6 For certain substances very specific control measures apply; e.g. asbestos, benzene. In cases where failure of the control measures could result in risk to health and safety, or where their adequacy or efficiency is in doubt, the exposure of personnel should be monitored and a record kept for future reference.

26.3 Asbestos dust

26.3.1 All types of asbestos have a fibrous structure and can produce harmful dust if the surface exposed to the air is damaged or disturbed. The danger is not immediately obvious because the fibres which can damage the lungs and can cause lung cancer are too small to be seen with the naked eye. Asbestos which is in good condition is unlikely to

release fibres, but where the material is damaged or deteriorating, or work is undertaken on it, airborne fibres can be released. Dry asbestos is much more likely to produce dust than asbestos that is thoroughly wet or oil-soaked. Asbestos is particularly likely to occur on older vessels in insulation and panelling, but certain asbestos compounds may also be found elsewhere and on other vessels in machinery components such as gaskets and brake linings.

26.3.2 Ship owners should advise masters of any location where asbestos is known or believed to be present on their ship. Masters and/or safety officers should keep a written record of this information and should also note any other position where asbestos is suspected, but they should not probe or disturb any suspect substance. Crew members who work regularly near asbestos or a substance likely to contain it should be warned of the need for caution and should report any deterioration in its condition such as cracking or flaking.

26.3.3 The condition of old asbestos may deteriorate and where reasonably practicable consideration should be given to is removal. This should be carried out in port and a specialist removal contractor should be used, to ensure adequate protective procedures. Where the port is in Cyprus and the work involves asbestos insulation or asbestos coating or de-coating it is necessary for the contractor to hold a licence issued by the Department of Labour Inspection. If such work is carried out outside Cyprus the contractor should be of equivalent competence.

26.3.4 If it is essential to carry out emergency repairs liable to create asbestos dust while the ship is at sea strict precautions, including the use of the appropriate protective clothing and respiratory protective equipment. See also the general guidance on the assessment and control of risks from hazardous substances in section 11.6 of this Code.

26.4 Dangerous goods

26.4.1 All dangerous goods and substances carried as cargo on ships have to be classified, packaged and labelled for transport in accordance with the International Maritime Dangerous Goods (IMDG) Code.

26.4.2 Examples of the labels to be affixed to packages and containers of dangerous goods are given in the IMDG Code. These depict by colour, name and pictogram the particular dangers of that substance (flammability, toxicity, corrosiveness etc.).

26.5 Use of Chemical agents

26.5.1 A chemical from an unlabelled package or receptacle should never be used unless its identity has been positively established. In addition to the transport labelling referred to above, packaged substances supplied in Europe may also display similar or additional labelling for supply and use for compliance with the European Dangerous Preparations Directive (DPD).

26.5.2 Chemicals should always be handled with the utmost care. Eyes and skin should be protected from accidental exposure or contact.

26.5.3 Manufacturers' or suppliers' advice on the correct use of the chemicals should always be followed. Some cleaning agents, even though used domestically, for example, caustic soda and bleaches, may burn the skin.

26.5.4 Chemicals should not be mixed unless it is known that dangerous reactions will not be caused.

26.6 Dry-cleaning operations

26.6.1 The principal hazard presented by a dry-cleaning solvent is that it is highly volatile, producing a vapour which is anaesthetic. Effective mechanical ventilation should therefore be provided in any compartment containing dry-cleaning plant. Smoking should be prohibited in compartments when the solvent is present.

26.6.2 Dry cleaning solvent is also a potential cause of skin damage, and suitable personal protective equipment should be worn.

26.6.3 A responsible person should be appointed to take overall responsibility for the security and operation of the dry-cleaning plant, and access should be controlled.

26.7 Safe use of pesticides

26.71 Where pesticides are used in the cargo spaces of ships or cargo units, safety procedures should be in accordance with the IMO publication "Recommendations on the Safe Use of Pesticides" (1996). A copy of this publication should be retained on board and kept accessible for all crew members.

26.7.2 Where space and surface spraying operations are being carried out by the crew, the master should ensure that the appropriate protective clothing, gloves, respirators and eye protection are being worn.

26.7.3 Ship's personnel should not handle fumigants and such operations should be carried out only by qualified operators. Fumigation should only be carried out with the agreement of the ship's master.

26.7.4 The master should choose to allow an in-transit fumigation only after first referring to the requirements of the ship's own national administration, and seeking the approval of the administration of the state of the vessel's next destination or port of call. The master should provide safe working conditions and ensure that at least two members of his crew including one officer have received the appropriate training. They should be familiar with the recommendations of the fumigant manufacturer concerning the methods of detection of the fumigant in air, its behaviour and hazardous properties, symptoms of poisoning, relevant first-aid treatment and special medical treatment and emergency procedures.

26.7.5 The "Fumigation Warning" sign should be conspicuously displayed on cargo units or spaces under fumigation. A watchman should be posted to prevent access to areas of risk by unauthorised personnel.

Chapter 27 - Use of Safety Signs

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

27.1 Introduction

27.1.1 Safety signs should be used to indicate hazards or control measures to be taken where the hazard cannot otherwise be removed.

27.2 Signs and notices

27.2.1 The international standards for safety signs are explained in the following paragraphs. Annex 27.1 shows the international colour coding of signs.

27.2.2 **Permanent signs** are used:

to give prohibitions, warnings and mandatory requirements;

to mark emergency escape routes;

to identify first aid facilities;

to show the location of fire fighting equipment.

27.2.3 **Red signs** mean either:

stop doing something or don't do it (prohibition);

stop/shut down or evacuate;

or they mark the location and type of fire-fighting equipment.

27.2.4 Signs of prohibition are based on a red circular band with a red diagonal bar and white backing. The symbol for the prohibited action is shown in black behind the red diagonal bar:

for example, "No smoking" with a cigarette depicted.

27.2.5 A sign indicating fire-fighting equipment is a red square or rectangle, with information given in words or by a symbol in white. Alternatively an IMO sign is a square or rectangle, with information given in words or by a symbol in red.

27.2.6 **Yellow signs** are advisory and mean:

be careful, or take precautions.

27.2.7 Warning signs are based on a yellow triangle with a black border. The symbol for the hazard is shown in black:

for example, poisoning risk with black skull and crossbones on the yellow background.

27.2.8 **Blue signs** are mandatory and mean:

take specific action.

Mandatory signs are based on a blue disc. The symbol for the precaution to be taken is shown in white:

for example, “Goggles to be worn” with a man’s head with goggles depicted.

If, exceptionally, no suitable symbol is available, appropriate wording may be used instead:

for example, “Keep Clear”.

27.2.9 **Green signs** mean:

emergency escape; or

first aid sign.

27.2.10 The sign is a green square or rectangle, with safety information shown by words or a symbol in white.

for example, a white arrow on a green background points to an emergency exit.

27.2.11 If more information is needed to make clear the meaning of any symbols used in a safety sign or notice, then a supplementary sign with text only may appear below the sign:

for example, “Not Drinking Water”.

The supplementary sign should be oblong or square and either:

(a) white with text in black; or

(b) the same background colour as the safety colour used on the sign it is supplementing, with the text in the relevant contrasting colour.

27.2.11 Shore based personnel and passengers may not be aware that they are colour blind, and colour should not be used as a sole indicator.

27.2.13 Where a language other than English is extensively used on a ship, any text used in conjunction with a sign should usually be displayed also in that language.

27.3 Occasional signs

27.3.1 Illuminated signs, acoustic signals, hand signals and spoken signals may also be used for temporary hazards or circumstances.

27.3.2 Illuminated signs and acoustic signals must be tested regularly to ensure that they are working. Acoustic signs should comply with the IMO Code on Alarms and Indicators 1992.

27.3.3 The internationally understood hand signals for use of lifting appliance are given in Annex 20.1.

27.3.4 Spoken signals should comply with the IMO Standard for Marine Navigational Vocabulary. This is particularly important when communicating with another ship or with shore-side workers abroad, where English is not much used.

27.4 Electrical wiring

27.4.1 The cores of electrical cables should be readily identifiable throughout their length by colours or numbers. Although various standards (Cyprus, other national or international) exist for colour coding of cores, the colours specified in the standards differ. The colours found on any ship will therefore depend on the country of building or of manufacture of the cables. Care should therefore always be taken to make a positive identification of cable duty, and colours should be used primarily as a means of conductor tracing.

27.4.2 Particular care is required when connecting plugs to domestic equipment which has been brought on to a ship, as a wrong connection could prove fatal. New equipment should be supplied with cable to the international standard, i.e. brown for “live”, blue for “neutral” and yellow/green for “earth”, but older equipment and that purchased abroad may have other colours.

27.5 Gas cylinders

27.5.1 Gas cylinders used on Cyprus ships should be marked and colour Coded according to CYS EN 1089-3: 1997 (see appendix 1).

27.5.2 Each cylinder should be clearly marked with the name of the gas and its chemical formula or symbol. The cylinder body should be coloured according to contents, with, where necessary, a secondary colour band painted around the neck of the cylinder to denote the particular hazards of the gas (flammability, toxicity etc.). Examples of such colour coding on gas cylinders commonly used on board ship are as follows:

Name of gas	Chemical formula symbol	Ground colour of container	Colour of band
Oxygen	O2	Black	None
Carbon Dioxide	CO2	Black	None
Compressed Air	None (mixed gases)	French Grey	None
Nitrogen	N2	French Grey	Black
Acetylene	C2H2	Maroon	None
Propane	None (mixed gases)	Signal Red	None
Butane	None (mixed gases)	None Specified	Signal Red

27.5.3 Medical gas cylinders carried on board should similarly be marked in accordance with BS 1319:1976 or equivalent. The name of the gas or gas mixture contained in the cylinder should be shown on a label affixed to it. The chemical symbol of the gas should be given on the shoulder of the cylinder. The cylinder should also be colour-Coded according to the contents as shown in the following examples:

Name of Gas	Symbol	Colour of Body	Colour of Valve
Oxygen	O2	Black	White
Compressed Air (for breathing app)	AIR	Grey	White and Black

27.6 Pipelines

27.6.1 The following colour coding system is recommended for adopting for the main common pipeline services of Cyprus registered ships:

Pipe contents	Basic Identification Colour	Colour Code Band
Water (Fresh)	Green	Blue
Water (Salt)	Green	None
Water (Fire Extinguishing)	Green	Safety Red
Compressed Air	Light Blue	None
Steam	Silver Grey	None
Oil (Diesel Fuel)	Brown	White
Oil (Furnace Fuel)	Brown	None
Oil (Lubricating)	Brown	Emerald Green

27.6.2 The basic identification colour should be applied on the pipe either on its whole length or as a colour band at regular intervals on the pipe. The colour should similarly be applied at junctions, both sides of valves, service appliances, bulkheads etc., or at any

other place where identification might be necessary. Valves on pipelines used for fire fighting should be painted red.

27.6.3 Where applicable, the colour Code banding should be in approximately 100 mm widths at regular intervals along the length of the pipe on the basic identification colour or painted between two basic identification colour bands each of a width of about 150 mm as shown in the following examples:

Pipe contents	**Basic colour (150 mm approx.)**	**Colour Code (100 mm approx.)**	**Basic colour (150 mm approx.)**
Water (Fresh)	Green	Blue	Green
Water (Fire Extinguishing)	Green	Safety Red	Green
Diesel Fuel	Brown	White	Brown

27.6.4 Care should be taken to ensure that when replacing or repainting pipes, valves etc., the correct colour is used.

27.6.5 When it is necessary to know the direction of the flow of the fluid, this should be indicated by an arrow situated in the proximity of the basic identification colour and painted white or black in order to contrast clearly with that colour.

27.6.6 Such a system as recommended above would be useful, for instance, in tracing a run of pipes but should not be relied upon as a positive identification of the contents of the pipe; a check should always be made before opening up and precautions taken against the contingency that the content is other than that expected.

27.6.7 Other pipeline systems on ships, such as cargo pipelines, may be colour Coded in a similar fashion but no specific recommendations are made here because a comprehensive system to cover the needs of all types of ship would require so wide a range of colours that contrasts would be small and easily obscured by fading or dirt.

27.6.8 Colour coding of pipelines may vary from ship to ship and seamen moving from one ship to another should check with a competent officer what the colours mean on each particular vessel.

27.7 Portable fire extinguishers

27.7.1 Portable fire extinguishers must comply with CYS EN 3-1:1996 standard (see appendix 1).

27.7.*2 Extinguishers* must comply with above standard. The body of the extinguisher is red, with a zone of colour of up to 5% of the external area to identify the extinguishing agent. Manufacturers have complied with this by printing the operating instructions in the appropriate colour.

27.7.3 It is possible to increase the visibility of the extinguishers by highlighting the area around the extinguisher with the appropriate colour coding (as in below). No additional colour should be added to the extinguishers, as this may invalidate the kite mark.

27.7.4 The following is the recommended systems of colour coding by medium (BS 7863:1996 standard see appendix 1):

Water	- Signal Red
Foam	- Pale Cream
Powder Dioxide	- French blue
Carbon Dioxide	- Black
Vaporising liquid (Halon)	- Emerald Green

The area so coded should be large enough to be readily apparent. Where the coding does not cover the whole surface of the extinguisher it is recommended that the remaining area should be either:

(a) Predominantly signal red; or

(b) of self-coloured (i.e. natural) metal.

27.7.5 Where there is a mixture of the two types of extinguishers on a ship, as far as possible they should be grouped so as to avoid confusion.

Annex 27.1

PART 1 – Prohibitory signs

Symbol	Meaning
	**Prohibition – Do not do**

Examples:

No smoking

Smoking and naked flames forbidden

No access for pedestrians

Do not extinguish with water

Not drinkable

No access for unauthorised persons

No access for industrial vehicles

Do not touch

PART 2 – Warning signs

Symbol	Meaning
	**Warning –** Danger

Examples:

Flammable material or high temperature (a)

Explosive material

Toxic material

Corrosive material

Radioactive material

Overhead load

Industrial vehicles

Danger: electricity

General danger

Laser beam

Oxidant material

Non-ionising radiation

PART 3 – Mandatory signs

Symbol	Meaning
	**Mandatory –** Must do

Examples:

eye protection must be worn

Safety helmet must be worn

Ear protection must be worn

Respiratory equipment must be worn

Safety boots must be worn

Safety gloves must be worn

Safety overalls must be worn

Face protection must be worn

Safety harness must be worn

Pedestrians must use this route

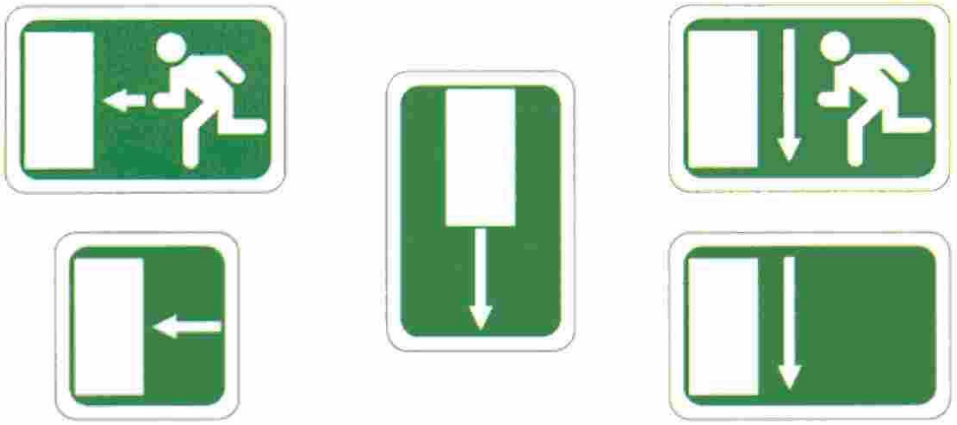
General mandatory sign (to be accompanied where necessary by another sign)

PART 4 – Emergency escape, first-aid signs and safe condition

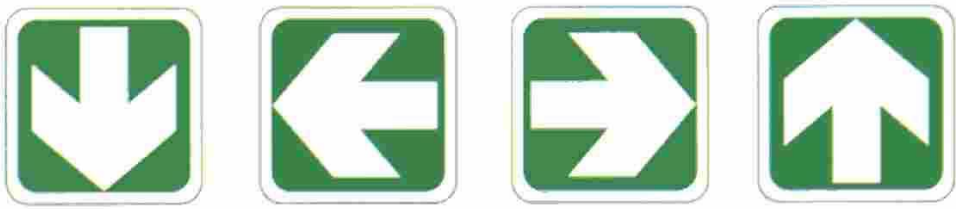
Symbol	Meaning
	Emergency Escape, First Aid and Safe Condition – The safe way

Examples:

Emergency exit/escape route signs

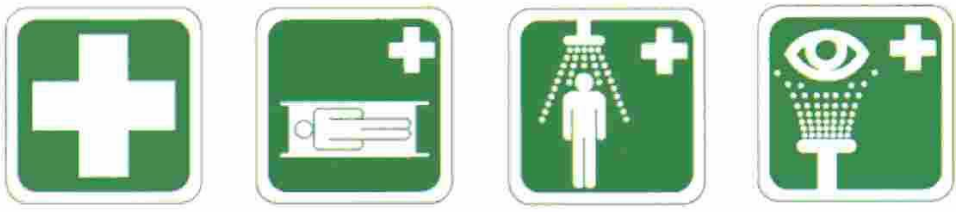


Supplementary information signs



This way

First aid signs



First-aid post **Stretcher** **Safety shower** **Eyewash**

PART 5 – Fire fighting signs

Symbol	Meaning
	**Fire Equipment –** Location or use of fire equipment

Examples:

Fire Hose

Ladder

Fire extinguisher

Emergency fire telephone

This way
(supplementary information sign)

Fire alarm

Fire extinguisher

Section 4 - Specialist Ships

Chapter 28 - Dry Cargo Ships

28.1 Stowage of cargo
28.2 Dangerous goods and substances
28.3 Carriage of containers
28.4 Working cargo
28.5 Lighting in cargo spaces
28.6 General precautions for personnel

Note: Chapters 18, 20 and 25 also have special relevance to work on Dry Cargo Ships

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

28.1 Stowage of cargo

28.1.1 This Chapter concerns both packages and dry bulk cargoes, with the exception of cargoes carried in roll-on, roll-off ships which are covered in Chapter 31.

28.1.2 All cargoes should be stowed and secured in a manner that will avoid exposing the ship and persons on board to unnecessary risk. The safe stowage and securing of cargo depends upon proper planning execution and supervision by properly qualified and experienced personnel.

28.1.3 The planned procedures for the handling of cargo should be agreed with berth or terminal operators in advance of loading or unloading. In the case of dry bulk cargo (excluding grain), procedures should follow the IMO Code of Practice for the Safe Loading and Unloading of Bulk Carriers, with the associated IMO Ship/Shore Safety Check List. For grain there is more detailed guidance in the International Code for the Safe Carriage of Grain in Bulk.

28.1.4 Loading, stowage and securing of cargo other than bulk cargo is to be carried out in accordance with the ship's approved Cargo Securing Manual. Handling and safety instructions for securing devices are contained in sections 3.1 and/or 4.1 of the manual. Further guidance is contained in the IMO Code of Practice for Cargo Stowage and Securing (IMO Resolution A.714/17). Cargo securing should be completed before the ship proceeds to sea.

28.1.5 All cargo should be stowed having due regard to the order of discharge. When planning the position of cargo and the order of loading and unloading, the effects that these operations will have upon access and the safety of personnel should be considered. The following points should be taken into account.

cargo information, including gross mass of the cargo units and any special properties detailed on board or in the shipping documents, should be recorded and used in planning;

wherever practicable, where more than one port is involved for loading or unloading, cargo should be loaded in layers rather than in tiers, so as to avoid the development of high vertical walls of cargo;

care should be taken not to overstow lighter cargoes with heavier cargoes which may lead to a collapse of the stow;

wherever practicable, cargo should be stowed so as to leave safe clearance behind the rungs of hold ladders and to allow safe access as may be necessary at sea;

the need to walk across or climb onto deck cargo, where this may involve an approach to an unprotected edge with risk of falling, should be minimised;

care should be taken to avoid large gaps next to cargo where it is stacked against corrugated bulkheads.

28.1.6 Deck cargo should be stowed in accordance with the statutory regulations, and kept clear of hatch coamings to allow safe access. Access to safety equipment, fire fighting equipment (particularly fire hydrants) and sounding pipes should also be kept free. Any obstructions in the access way such as lashings or securing points should be painted white to make them more easily visible. Where this is impracticable and cargo is stowed against ship's rails or hatch coamings to such a height that the rails or coamings do not give effective protection to personnel from falling overboard or into the open hold, temporary fencing should be provided (see Chapter 12.5 Guarding of openings).

28.1.7 Suitable safety nets or temporary fencing should be rigged where personnel have to walk or climb across built-up cargo, and are therefore at risk of falling.

28.1.8 When deck cargo is stowed against and above ship's rails or bulwarks, a wire rope pendant or a chain, extending from the ring bolts or other anchorage on the decks to the full height of the deck cargo, should be provided and used to save personnel having to go overside to attach derrick guys and preventers directly to the anchorages on the deck.

28.1.9 Where beams and hatch covers have to be removed at intermediate ports before surrounding deck cargo is unloaded, an access space at least one metre wide should be left adjacent to any part of the hatch or hatchway that is to be opened. If on deck this is impracticable, fencing or lifelines should be used to enable seamen to remove and replace beams and hatch coverings in safety (see Chapter 12.5 Guarding of Openings).

28.1.10 In the 'tween decks, guidelines should be painted around 'tween deck hatchways at a distance of one metre from the coamings.

28.2 Dangerous goods and substances

28.2.1 Chapter VII of SOLAS lays down requirements for carriage of dangerous substances and the provisions of the International Maritime Dangerous Goods (IMDG) Code together with those contained in relevant merchant shipping notices should be observed. The IMDG Code contains details of classification, documentation, packaging etc. and advice on such application as will meet the requirements of the regulations. In particular it lists and gives details of many dangerous substances.

28.2.2 The general introduction and the introductions to individual classes of the IMDG Code contain many provisions to ensure the safe handling and carriage of dangerous goods including requirements for electrical equipment and wiring, fire fighting equipment, ventilation, smoking, repair work, provision and availability of special equipment etc., some of which are general for all classes and other particular to certain classes only. It is important that reference should be made to this information before handling dangerous goods. Some of the requirements are highlighted in subsequent paragraphs. Where any doubts exist, advice should be sought from the Department of Merchant Shipping or other competent authority.

28.2.3 Dangerous substances should be loaded or unloaded only under the supervision of a competent responsible officer. Suitable precautions, such as the provision of special lifting gear as appropriate, should be taken to prevent damaging to receptacles containing dangerous substances.

28.2.4 Dangerous substances should not be loaded other than in accordance with the regulations – i.e. in accordance with the IMDG Code, and if applicable the ship's document of compliance for the carriage of dangerous goods. In the case of certain solid dangerous substances shipped in bulk, loading should be carried out in accordance with Appendix B of the Code of Safe Practice for Solid Bulk Cargoes published by the International Maritime Organisation (IMO). In addition, the Emergency Procedures for Ships Carrying Dangerous Goods, published by the IMO, should be consulted to ensure that appropriate emergency equipment is carried.

28.2.5 Additional Cyprus requirements govern the loading and unloading of explosives.

28.2.6 In compartments containing cargo which has an explosion of fire risk (e.g. explosives or flammable liquids), all electrical circuits and equipment (including any portable equipment) should meet the recommendations of the IMDG Code. Smoking and naked flames should be prohibited while cargo handling is in progress, except in authorised places, which should be clearly marked.

28.2.7 Emergency response procedures should be established. The application of such measures is under the control of the master of the ship and will depend on the circumstances of the incident and location of the ship. The equipment necessary for the execution of the emergency response should be immediately available and the crew trained and practised in its use.

28.2.8 These procedures should include:

cases of accidental exposure (see para 28.2.11 below);

the possibility of fire.

28.2.9 Personnel who are required to handle consignments containing dangerous substances, should be able to identify dangerous goods from the labelling and placarding and should promptly report any leakage, spillage or any other incident which occurs involving exposure to dangerous substances.

28.2.10 Those required to handle dangerous substances, should be provided with and wear personnal protective equipment (including breathing apparatus, where necessary) appropriate to the hazard involved.

28.2.11 In the event of accidental exposure to dangerous substances, reference should be made to the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) published by IMO.

28.2.11 Appropriate measures should be taken promptly to render harmless any spillage of dangerous substances. Particular care should be taken when dangerous substances are carried in refrigerated spaces where any spillage may be absorbed by the insulating material. Insulation affected in this way should be inspected and renewed if necessary.

28.2.13 Where there is a leakage or escape of dangerous gases or vapours from the cargo, personnel should leave the danger area and the area should be treated as an enclosed or confined space (see Chapter 16). Personnel required to deal with spillages or to remove defective packages should be provided with and wear suitable breathing apparatus and protective clothing as the circumstances dictate. Suitable rescue and resuscitation equipment should be readily available in case of an emergency (see Chapter 4).

28.2.14 Guidance on the assessment and control of risks from substances hazardous to health is also given in Chapter 26. Further guidance on the handling and stowage of dangerous goods is contained in the Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas published by IMO.

28.3 Carriage of containers

28.3.1 Containers are simply packages of pre-stowed cargo and sections of Chapters 20 and 25 may also be relevant to their safe working.

28.3.2 Where a container holds dangerous goods the relevant guidance contained in 28.2 should be followed. For guidance on control of substances hazardous to health refer to Chapter 26.

28.3.3 Freight containers should comply with the International Convention for Safe Containers 1972 (CSC). They should not be loaded beyond the maximum net weight indicated on the Safety Approval Plate, and should be in a safe condition for handling and carriage.

28.3.4 The equipment used for lifting a container should be suitable for the load, and safely attached to the container. The container should be free to be lifted and should be lifted slowly to guard against the possibility of the container swinging or some part of the lifting appliances failing, should the contents be poorly secured, unevenly loaded and

poorly distributed or weight of contents incorrectly declared. The process of loading and securing of goods into a container should follow the IMO/ILO/UN/ECE Guidelines for Packing of Cargo Transport Units (CTU's). Special care should be taken when lifting a container the centre of gravity of which is mobile, e.g. a tank container, bulk container or a container with contents which are hanging.

28.3.5 Safe means of access to the top of a container should be provided to release lifting gear, and to fix lashings, and personnel so engaged should, where appropriate, be protected from falling by use of a properly secured safety harness or other suitable means. Where containers are stacked account should be taken of the appropriate strength features and stacking induced stress. Containers should be lashed individually.

28.3.6 On ships not specially constructed or adapted for their carriage, containers should, wherever possible, be stowed for and aft, and should be securely lashed. Containers should not be stowed on decks or hatches unless it is known that the decks or hatches are of adequate overall and point load-bearing strength. Adequate dunnage should be used.

28.3.7 The system of work should be such as to limit the needs to work on container tops. Where the design for securing of containers and the checking of lashing makes access onto the container tops necessary, it should be achieved by means of the ship's superstructure or by a purpose-designed access platform or personnel cages using a suitable adapted lifting appliance. If this is not possible, an alternative safe system of work should be in place.

28.3.8 To allow access to the tops of over-height, soft top or tank containers where necessary for securing or cargo handling operations, solid top or "closed containers" should be stowed between them whenever practicable.

28.3.9 Where the ship's electrical supply is used for refrigerated containers, the supply cables should be provided with proper connections for the power circuits and for earthing the container. Before use the supply cables and connections should be inspected and any defects repaired and tested by a competent person. Supply cables should only be handled when the power is switched off. Where there is a need to monitor and repair refrigeration units during the voyage, account should be taken of the need to provide safe access in a seaway when stowing these containers.

28.3.10 Personnel should be aware that containers may have been fumigated at other points in the transport chain, and there may be a residual hazard from the substances used.

28.4 Working cargo

For regulations and guidance on lifting equipment and lifting operations, including examination and testing requirements, see Chapter 7.3 – 7.5 and Chapter 20 of this Code.

28.4.1 Safety arrangements prior to working cargo should ensure that adequate and suitable lifting plant is available, in accordance with the register of lifting appliances and cargo gear, and that all plant and equipment, and any special gear necessary is available and used. Cargo gear should be checked regularly throughout the cargo operation for damage or malfunction.

28.4.2 Repair or maintenance work, such as chipping, spray painting, shot-blasting or welding, should not be undertaken in a space where cargo operations are in progress, if such work could create a hazard to personnel working in the space.

28.4.3 Loads being lowered or hoisted should not pass or remain over any person engaged in any work in the cargo space area, or over means of access. Personnel should take care when using access ladders in hatch squares whilst cargo operations are in progress.

28.4.4 Cargo information for goods should always provide the gross mass of the cargo or of the cargo units. Where loads of significant gross mass are not marked with their weight, the loads should be check-weighted unless accurate information is available as provided by the shipper or packer of the goods.

28.4.5 A signaller should always be employed at a hatchway when cargo is being worked unless the crane driver or winchman has a complete unrestricted view of the load or total working area. The signaller should be in a position where he has a total view of the operation, where this is not possible then additional signallers should be used to assist. Guidance for signallers is given in 20.2.11 to 20.2.16.

28.4.6 Before giving a signal to hoist, the signaller should receive clearance from the person making up the load that it is secure, and should ascertain that no one else would be endangered by the hoist. Before giving the signal to lower, he should warn personnel in the way and ensure all are clear.

28.4.7 Loads should be raised and lowered smoothly, avoiding sudden jerks or "snatching". When a load does not ride properly after being hoisted, the signaller should immediately give warning of danger and the load should be lowered and adjusted as necessary.

28.4.8 Hooks, slings and other gear should not be loaded beyond their safe working loads. Strops and slings should be of sufficient size and length to enable them to be used safely and be so applied and pulled sufficiently tight to prevent the load or any part of the load from slipping and falling. Loads (sets) should be properly put together and properly slung before they are hoisted or lowered.

28.4.9 Before any heavy load is swung, it should be given a trial lift in order to test the effectiveness of the slinging.

28.4.10 Except for the purpose of breaking out or making up slings, lifting hooks should not be attached to:

(a) the bands, strops or other fastenings of packages of cargo, unless these fastenings have been specifically provided for lifting purposes;

(b) the rims (chines) of barrels or drums for lifting purposes, unless the construction or condition of the barrels or drums is such as to permit lifting to be done safely with properly designed and constructed can hooks.

28.4.11 Suitable precautions, such as the use of packing or chafing pieces, should be taken to prevent chains, wire and fibre ropes from being damaged by the sharp edges of loads.

28.4.12 When slings are used with barrel hooks or other similar holding devices where the weight of the load holds the hooks in place, the sling should be led down through the egg or eye link and through the eye of each hook in turn so that the horizontal part of the sling draws the hooks together.

28.4.13 The angle between the legs of the slings should not normally exceed 90º, as this reduces the safe working load of the sling. Where this is not reasonably practicable, the angle may be increased up to 110º provided that the slings have been designed to work at the greater angles. However it should be noted that at 110º, each sling leg is taking stress equivalent to the whole mass of the load.

28.4.14 Trays and pallets (unit loads) should be hoisted with four-legged slings and where necessary, nets and other means should be used to prevent any part of the load falling.

28.4.15 Bundles of long metal goods such as tubes, pipes and rails, should be slung with two slings necessary, nets and other means should be used to prevent any part of the load falling.

28.4.16 Logs should be loaded or discharged using wire rope slings of adequate size; tongs should not be used except to break out loads.

28.4.17 Cargo buckets, tubs and similar appliances should be carefully fitted so that there is no risk of the contents falling out and be securely attached to the hoist (for example, by a shackle) to prevent tipping and displacement during hoisting and lowering.

28.4.18 Shackles should be used for slinging thick sheet metal, if there are suitable holes in the material; otherwise suitable clamps on an endless sling should be used.

28.4.19 Loose goods such as small parcels, carboys, small drums etc. should be loaded or discharged in suitable boxes or pallets with sufficiently high sides, and lifted using four-legged slings.

28.4.20 Slings or chains being returned to the loading position should be securely hooked on the cargo hook before the signaller gives the signal to hoist. Hooks or claws should be attached to the egg link or shackle of the cargo hook, not allowed to hang loose. The cargo hook should be kept high enough to keep slings or chains clear of personnel and obstructions.

28.4.21 ”One-trip slings”, that is, slings which have not been used previously for lifting and are fitted to the load prior to loading, should not be taken back on board ship after the load is discharged at the end of the voyage, but should be left on shore for disposal.

28.4.22 When work is interrupted or has ceased for the time being, the hatch should be left in a safe condition, with either guard rails or the hatch covers in position.

28.5 Lighting in cargo spaces

28.5.1 During cargo operations cargo spaces should be adequately lit, avoiding strong contrasts of light and shadow or dazzle (see Chapter 6.4.5). Open or naked lights should not be used. Portable lights should be adequately guarded, suitable for the task, and firmly secured in such a manner that they cannot be accidentally damaged. Portable lights should never be lowered or suspended by their electrical leads, and leads should be run so that they are clear of loads, running gear and moving equipment.

28.6 General precautions for personnel

28.6.1 Personnel undertaking duties in cargo spaces should move with caution over uneven surfaces or over loose dunnage and be alert to protrusions such as nails etc.

28.6.2 Where vessels have been built with corrugated bulkheads precautions such as suitable rails, grids or nets should be erected to prevent cargo handlers or other personnel from getting trapped between the rear of the corrugation and the stowed cargo.

28.6.3 Where work is being undertaken on or near the cargo “face”, the “face” should be secured against collapse, especially where bagged cargo may be bleeding from damage. Where it is necessary to mount a “face” a portable ladder should be used, properly secured against slipping or shifting sideways, or held in position by other personnel. When work is undertaken in areas where there is a risk of falling, safety net(s) should be erected. Such nets should not be secured to hatch covers.

28.6.4 Personnel should be aware that cargoes may have been fumigated at other points in the transport chain, and there is a risk that toxic fumes may build up in enclosed spaces.

Chapter 29 - Tankers and Other Ships Carrying Bulk Liquid Cargoes

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

29.1 General

29.1.1 Masters, officers and ratings appointed to work on tankers or similar vessel must meet the minimum training and qualifications requirements specified in regulation V/1 of the International Conventions on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended in 1995.

29.1.2 Training in emergency procedures and in the use of any special emergency equipment should be given as appropriate to members of the crew at regular intervals. The instruction should include personal first aid measures for dealing with accidental contact with harmful substances in the cargo being carried and inhalation of dangerous gases and fumes.

29.1.3 Because of the risks of ill effects arising from contamination by certain liquid cargoes, especially those carried in chemical tankers and gas carriers, personnel should maintain very high standards of personal cleanliness and particularly so when they have been engaged in cargo handling and tank cleaning.

29.1.4 Those on board responsible for the safe loading and carriage of the cargo should have all the relevant information about its nature and character before it is loaded and about the precautions which need to be observed during the voyage. The remainder of the crew should be advised of any precautions which they too should observe.

29.1.5 High risks required the strict observance of rules restricting smoking and the carriage of matches or cigarette lighters.

29.1.6 Spillages and leakages of cargo should be attended to promptly. Oil-soaked rags should not be discarded carelessly where they may be a fire hazard or possibly ignite spontaneously. Other combustible rubbish should not be allowed to accumulate.

29.1.7 Cargo handling equipment, testing instruments, automatic and other alarm systems should be maintained to a very high standard of efficiency at all times. Where electrical equipment is to be used in the cargo area it should be of an approved design and "certified safe". The safety of this equipment depends on a maintenance of high order which should be carried out only by competent persons. Unauthorised personnel should not interfere with such equipment. Any faults observed, such as loose or missing

fastenings or covers, severe corrosion, cracked or broken lamp glasses etc. should be reported immediately.

29.1.8 Work about the ship which might cause sparking or which involves heat should not be undertaken unless authorised after the work area has been tested and found gas-free, or its safety is otherwise assured.

29.1.9 Where any enclosed space has to be entered, the precautions given in Chapter 16 should be strictly observed. Dangerous gases may be released or leak from adjoining spaces while work is in progress and frequent testing of the atmosphere should be undertaken. "Permit-to-work" procedures should generally be adopted – see Chapter 16.7.

29.2 Oil and bulk ore/oil carriers

29.2.1 Tankers and other ships carrying petroleum or petroleum products in bulk, or in ballast after carrying these cargoes, are at risk from fire or explosion arising from ignition of vapours from the cargo which may in some circumstances penetrate into any part of the ship.

29.2.2 Additionally, vapours may be toxic, some in low concentrations, and some liquid products, especially petrol (gasoline) treated with tetra-ethyl or tetra-methyl-lead, are harmful in contact with the skin.

29.2.3 Guidance on the general precautions which should be taken is given in publications of the International Chamber of Shipping:

(a) International Safety Guide for Oil Tankers and Terminals;

(b) Safety in Oil Tankers, a handbook for crew members.

Companies are additionally required, under the ISM Code, to have their own safety regulations. These publications should be available on board and the guidance conscientiously followed.

29.3 Liquefied gas carriers

29.3.1 Guidance on the general precautions which should be taken on these vessels is given in the Tanker Safety guide (Liquefied Gas) and Safety in Liquefied Gas Tankers (a handbook for crew members) published by the International Chamber of Shipping. The IMO Codes for the Constructions and Equipment of Ships Carrying Liquefied Gases in Bulk contain guidance on operational aspects and are mandatory under the relevant Merchant Shipping regulations.

29.3.2 It should be noted that cargo pipes, valves and connections and any point of leakage at the gas cargo may be intensely cold. Contact may cause severe cold burns.

29.3.3 Pressure should be carefully reduced and liquid cargo drained from any point of the cargo transfer system, including discharge lines, before any opening up or disconnecting is begun.

29.3.4 Some cargoes such as ammonia have a very pungent, suffocating odour and very small quantities may cause eye irritation and disorientation together with chemical burns. Seafarers should take this into account when moving about the vessel, and especially when climbing ladders and gangways. The means of access to the vessel should be such that it can be closely supervised and is sited as far away from the manifold area as possible. Crew members should be aware of the location of eye wash equipment and safety showers.

29.4 Chemical carriers

29.4.1 A bulk chemical tanker may be dedicated to the carriage of one or a small number of products or it may be constructed with a large number of cargo tanks in which numerous products are carried side by side simultaneously.

29.4.2 The products carried range from the so-called non-hazardous to those which are extremely flammable, toxic or corrosive or have a combination of these properties, or which possess other hazardous characteristics.

29.4.3 The ship arrangements and the equipment for cargo handling may be complex and require a high standard of maintenance and the use of special instrumentation, protective clothing and breathing apparatus for entry into enclosed spaces.

29.4.4 The International Maritime Organisation (IMO) has produced Codes (the IBC Code and the BCH Code) for the construction and equipment of ships carrying dangerous chemicals in bulk. They contain some operational guidance, and the associated index of dangerous chemicals carried in bulk contains reference to the Medical First Aid Guide for Use in Accidents Involving Dangerous Goods (MFAG) published by IMO.

29.4.5 Guidance on general operational procedures and precautions which should be followed on chemical tankers is given in the Tanker Safety Guide (Chemicals) and the booklet “Safety in Chemical Tankers”, both published by the International Chamber of Shipping. These publications, together with the Codes referred to above and any special safety requirements issued by the company should be available on board.

29.4.6 Many products carried on chemical tankers are loosely referred to as alcohols. Drinking these could lead to serious injury and death, and strict controls should be exercised when carrying such cargoes in order to prevent pilfering.

Chapter 30 - Ships Serving Offshore Oil and Gas Installations

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages

This Chapter applies to such ships

30.1 General

30.1.1 Ships serving offshore oil and gas installations are often expected to operate in adverse weather conditions. Cargo operations should not be undertaken, except in an emergency, if there is any danger of the crew being injured by water on deck or shifting cargo. For the avoidance of doubt, an emergency does not mean when an installation is short of water, food or drilling equipment.

30.1.2 The master of the vessel has the final responsibility for ensuring that any operation is carried out with proper regard to the safety of all those on board and that measures are taken to minimise risks.

30.1.3 The Offshore Installation Manager controls the entry of all vessels into the 500 metre zone around the installation and can modify or terminate any support vessel activity that they regard as hazardous to the installation or persons on it.

30.1.4 The crane driver may also terminate a cargo operation on safety grounds.

30.1.5 Where a vessel has open stern and deck gangway doors and a low freeboard, particular care should be taken against loss of watertight integrity by ensuring that scuttles, deadlights, hatches and ventilators are securely closed. Freeing ports should be kept clear and unobstructed to ensure the rapid drainage of water trapped on the deck.

30.1.6 While work is being done on the deck the ship's heading and speed should be adjusted to provide as safe a working platform as possible. A look-out should be kept to give warning of imminent oncoming, quartering or following seas, or the operation suspended until the risk of shipping seas is over.

30.1.7 At all times work is being done on the deck, there should be an efficient means of communication between bridge, crane and crew. This should be by a hand-held radio on an uncluttered working frequency, backed up by a tannoy system.

30.1.8 During hours of darkness, sufficient lighting should be provided at access ways and at any work location, to ensure that obstructions are clearly visible, that persons working on deck can be clearly seen from the bridge and installation and that the operation may be carried out safely.

30.1.9 Lighting should be so placed that it does not dazzle the navigational watch and does not interfere with prescribed navigation lights.

30.1.10 If working on deck cannot be avoided during bad weather, lifelines should be rigged on the working deck to facilitate safe movement. Decks should as far as practicable be kept free from ice, slush and any substance or loose material likely to cause slips and falls.

30.1.11 Men working in cold and wet conditions should wear water-proof garments over warm clothing. The need to avoid undue exhaustion and hands and limbs becoming numbed should be taken into account when making the necessary arrangements for relief at suitable intervals.

30.1.12 If it is necessary for a man to work in an exposed position he should, where practicable, wear a safety harness and lifeline, and one of the approved types of self-inflating buoyancy aids which would not unduly hamper or impede working movements.

30.1.13 Safety helmets and high visibility garments should be worn during work on deck.

30.1.14 Advice on mooring and casting off is given in Chapter 24.

30.1.15 Further advice and guidance on Offshore Support Vessel operations may be found in the UKOOA/Chamber of Shipping "Guidelines for the Safe Management and Operation of Offshore Support Vessels". For further information on this document telephone UKOOA on (0044) 207 802 2400 of the Chamber of Shipping on (0044) 207 417 8400. A copy of the document is publicly available on the Internet on www.british-shipping.org.

30.2 Carriage of cargo on deck

30.2.1 The safe securing of all deck cargoes should be checked by a competent person before the vessel proceeds on passage. The master is responsible for ensuring that it is correctly stowed and adequately secured for the intended voyage. Areas on the deck which are not to be used for cargo stowage should be clearly marked or otherwise indicated.

30.2.2 To aid unloading at sea to be carried out safely, independent cargo units should, as far as practicable, be individually lashed. Where it is not practical to lash individual pieces of cargo, then groups of lifts intended for the same delivery location should be secured together. Lashings should, where practicable, be of a type that can be easily released and maintained.

30.2.3 All lashings should be checked at least once during each watch whilst at sea. Personnel engaged in the operation should be closely supervised from the bridge, particularly in adverse weather conditions. At night in bad weather, an Aldis lamp or

searchlight should be used to aid remote checking of lashings to avoid placing personnel at risk.

30.2.4 Where fitted, pipe posts to restrain the movement of tubulars should be used.

30.2.5 Discarded rope and damaged and unserviceable equipment and cargo should not be jettisoned at sea but retained for disposal ashore. Such materials and articles can foul propellers or cause damage to fishing gear.

30.3 Lifting, hauling and towing gear

30.3.1 All mixed and running gear should be carefully maintained in good order and regularly inspected to detect wear, damage and corrosion. Statutory requirements for the use, maintenance and thorough examination of lifting plant are explained in Chapters 7 and 20. More frequent inspections should be made where gear has hard use or is much exposed to sea and weather.

30.3.2 In all operations which may impose large loads or shock strains upon the gear, precautions should be taken against sudden failure which may cause injury to personnel. As far as practicable, the system should be so defined that the weakest element is at a point where failure is likely to cause least danger.

30.3.3 While gear is under load, personnel essential for the operation should keep in protected positions to the greatest practicable extent. Others not engaged in the operations should keep clear of the working area.

30.4 Preparation for cargo handling

30.4.1 It is important to plan in advance, both at the shore terminal and offshore to aid effective cargo securing. The objective of pre-planning is the safe and practical restraint of cargo carried on the deck of offshore support vessels so that personnel, ship and cargo may be reasonably protected at all stages of carriage, and during cargo operations offshore.

30.4.2 The master and the Offshore Liaison Manager or their representatives must establish liaison prior to unloading or backloading of cargo.

30.4.3 The order of loading/discharging and stowage arrangements should be pre-planned in order to avoid wherever possible the “slotting-in” of containers and the necessity for any person to climb on top of the cargo.

30.4.4 The master should ensure he is provided with details of any unusual items of cargo, including dangerous goods, cargoes requiring special sea-fastening arrangements, or heavy lifts before loading.

30.5 Approaching installation and cargo handling at installation

30.5.1 The master should pre-plan his approach to the installation with the vessel set up prior to the final approach to take account of the prevailing wind and tide etc.

30.5.2 In the event that it is necessary to drop anchor personnel should never stand forward of the windlass when letting go anchors at the installation. This is particularly important in vessels of this type because of the length of chain and the loads thus imposed. Care should be taken when stowing the anchor chain in the chain locker (see Chapter 24).

30.5.3 In bad weather and under certain conditions of trim, considerable amounts of water may be shipped over the after-deck when the vessel is approaching an installation stern-on under power. Personnel should be alert to this possibility and remain in positions of shelter and safety until it is safe to proceed onto the deck.

30.5.4 Life-saving equipment, including lifebuoy, boathook and heaving line should be readily available at a suitable position on the stern and other points of particular danger when mooring and while cargo handling is in progress.

30.5.5 In applying the guidance of Chapter 20 to cargo handling, it should be borne in mind that the transfer of cargo at sea is at any time a difficult operation and the risks are greatly increased when heavy or bulk items are being handled from a combined deck space in a seaway.

30.5.6 The master has the authority to decide the sequence of cargo discharge to and back loading from the installation.

30.5.7 When cargo is being unloaded at the installation, the lashings of each individual item or cargo should not be released until the item is about to be lifted; there are grave risks if all cargo lashings are removed before loading operations are begun.

30.5.8 Once unlashed, cargo should be secured against movement as much as possible, until lifted.

30.5.9 Personnel should be at all times alert to the danger of being hit or crushed should items of cargo swing during a lift or become dislodged through sudden movement of the ship. For this reason, all personnel should seek positions of safety as far as practicable during the lifting and lowering of cargo. If, in some circumstances, cargo hooks have to be held until the strain is taken, as when pipes are to be unloaded, crew members thus engaged should immediately move to a safe position before the actual lift is effected.

30.5.10 Lifts should be speedily effected to hoist the load well off the deck and swung clear of the ship as quickly as possible.

30.5.11 If any back loading has to take place from the installation during off-loading of cargo from the vessel, care should be taken to ensure that the cargo taken on board is immediately secured against movement until it can be properly stowed.

30.5.11 It is essential that an efficient means of communication, preferably by radio link, is established by the installation crane operator and the working deck officer who should at all times be in visual contact with each other.

30.6 Transfer of personnel by ship to installation by "personnel baskets"

30.6.1 The following procedures should be observed for the transference of personnel from ship to installation by "personnel baskets":

(a) two people should steady the equipment when it is lowered to the deck;

(b) luggage should be secured within the net of the basket;

(c) personnel to be transferred should wear lifejackets and other PPE suitable for the water and sea conditions;

(d) personnel to be transferred should be evenly distributed around the base board to ensure maximum stability;

(e) personnel should stand outside the basket with feet apart on the board and the basket securely gripped with both arms looped through;

(f) when the officer in charge is satisfied that all is ready, and at an appropriate moment having regard to the movement of the ship in a seaway, the basket should be lifted clear of the vessel and then swung up and out as quickly as possible before being carefully hoisted up to the installation;

(g) throughout the operation, a lifebuoy, boathook and heaving line should be kept immediately available on board the vessel for use in case of an emergency;

(h) the arrangements for rescue and recovery of persons near the installation set out in the Installations Emergency Response Plan should be in place;

(i) radio communication should be set up between ship, Stand By Vessel and installation.

30.7 Transfer of personnel by boat

30.7.1 The master of the ship providing the boat should be responsible for the operation. Due consideration should be given to the effect of prevailing conditions on the safety of the transfer.

30.7.2 The boat should be reliably powered.

30.7.3 The boat must be crewed by no less than two experienced persons, at least one of whom must be experienced in handling the boat. Lifejackets and if necessary, suitable protective clothing, must be worn by all personnel.

30.7.4 A safety rope should be provided for all personnel ascending or descending overside by ship's ladder.

30.7.5 All personnel to be transferred should be briefed by a responsible Deck Officer. Boarding and disembarkation should be carried out in an orderly manner under the coxswain's direction.

30.7.6 The boat's coxswain should ensure an even and safe distribution of passengers. Passengers should not stand up or change their positions during the passage between ships, safely under instructions from the coxswain.

30.7.7 The parent vessel should establish communication with the receiving vessel prior to the commencement of the operation and should maintain continuous visual contact with the boat concerned throughout the transfer. It is recommended that the boat should carry a VHF radio.

30.7.8 If the transfer of personnel involves a Stand By Vessel, the master should bear in mind that his vessel must at all times be ready to fulfil its Stand By Vessel duties.

30.7.9 Where transfer is to or from an installation, personnel should be aware that ladders and platforms can be very slippery or rough with shells at water level.

30.8 Anchor handling

30.8.1 Handling installation anchors at sea can be a particularly hazardous and arduous task. The vessel should be controlled in such a manner to minimise the risks concerned, in particular to avoid as far as possible an anchor wire under heavy load whipping from quarter to quarter across the deck.

30.8.2 During bad weather lifelines should be rigged on the working deck to facilitate safe movement. Decks as far as practicable should be kept free from ice, slush and any substance or loose material likely to cause slips and falls.

30.8.3 The provisions of section 30.3.3 on the need for personnel to keep to protected positions are particularly important during the handling of anchors and anchor buoys. Lifelines should be provided.

30.8.4 Anchor buoys being lifted aboard should be kept clear of the working area and lashed immediately upon landing to prevent movement.

30.8.5 Care should be taken when stoppering of wires.

30.8.6 When anchors are let go over the stern, all personnel should be well forward of the stern and in protected positions.

Chapter 31 - Ro-Ro Ferries

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

31.1 Introduction

31.1.1 This section gives general advice for the safety of personnel working on the vehicle decks of ro-ro ferries. Where other documents or Chapters of this Code apply these are cross-referenced and should be read in conjunction with this Chapter.

31.2 General

31.2.1 The movement, stowage and securing of vehicles on vehicle decks and ramps should be supervised by a responsible ship's officer assisted by at least one competent person.

31.2.2 Smoking and naked flames should not be permitted on any vehicle decks. Conspicuous "No smoking" or "No Smoking/Naked Lights" signs should be displayed.

31.2.3 There should be no unauthorised persons on vehicle decks at any time, and there should be no entry to vehicle decks when the vessel is at sea unless specifically permitted.

31.2.4 Passengers and drivers should not be permitted to remain on vehicle decks without the express authority of a responsible ship's officer. The period prior to disembarkation when passengers and drivers are requested to return to their vehicles should be kept to a minimum.

31.2.5 Where closed circuit television (CCTV) cameras are fitted, they should, where practicable, have an uninterrupted view of the vehicle deck. The use of CCTV for

continuous watch does not necessarily preclude the need for car deck patrols – e.g. coupled with fire patrols of passenger accommodation.

31.3 Ventilation

31.3.1 Vehicle decks should have adequate ventilation at all times, with special regard to hazardous substances.

31.3.2 On passenger vessels, ventilation fans in closed ro-ro spaces must normally be run continuously whenever vehicles are on board. An increased number of air changes may be required when vehicles are being loaded or unloaded, or where flammable gases or liquids are stowed in a closed ro-ro space.

31.3.3 To reduce the accumulation of fumes, drivers should be instructed to stop their engines as soon as practicable after embarking and to avoid starting up prior to departure until instructed to do so. During loading and discharging ventilation may be improved by keeping both bow and stern doors open, provided that there is adequate freeboard at these openings. When there is doubt about the freshness of the atmosphere, arrangements should be made for testing of the atmosphere to ensure the maintenance of 21 per cent oxygen and a carbon monoxide content below 50ppm in the atmosphere of the space.

31.4 Fire safety/prevention

31.4.1 Fire detection systems should be switched on whenever vehicle decks are unattended. Deck and engine crew should be trained in the use of the drencher systems and their operation. Continuous monitoring of vehicle decks by CCTV or regular fire patrols should also be in place.

31.4.2 All fire doors should be kept closed on vehicle decks when the vessel is at sea.

31.5 Noise

31.5.1 Personnel working on vehicle decks should not be exposed to the equivalent of 90dB(A) or greater when averaged over an 8 hour day. Hearing protection should be available for use when the noise level is equivalent to or exceeds 85dB(A) averaged over an 8 hour day, and should be worn when it is equivalent to or exceeds 90dB(A) averaged over an 8 hour day. For further guidance on noise levels see the Noise Levels on Board Ships (IMO 1982).

31.6 Safe movement

31.6.1 Pedestrians should be warned of vehicle movements when entering or crossing car or vehicle decks and keep to walkways when moving about the ship.

31.6.2 As far as possible, routes used by vehicles should be separated from pedestrian passageways, and the use of ship's ramps for pedestrian access should be avoided. Ramps which are used by vehicles should not be used for pedestrian access unless there is suitable segregation of vehicles and pedestrians. Segregation can be achieved through the provision of a suitably protected walkway, or by ensuring that pedestrians and vehicles do not use the ramp at the same time.

31.6.3 Crew members should exercise great care when supervising the driving, marshalling and stowing of vehicles to ensure that no person is put at risk. The following precautions should be taken:

crew should be easily identifiable by passengers;

communications between deck officer and rating should be clear and concise to maintain the safety of passengers and vehicles;

there should be suitable traffic control arrangements, including speed limits, and where appropriate the use of signallers. Collaboration may be necessary with shore side management where they also control vehicle movements on board ship;

hand signals used by loading supervisors and personnel directing vehicles should be unambiguous;

adequate illumination should be provided;

personnel directing vehicles should keep out of the way of moving vehicles, and particularly those that are reversing by standing to the side, and where possible should remain within the driver's line of sight. Suitable high visibility clothing should be worn by all personnel working on vehicle decks. Extra care should be taken at the "ends" of the deck where vehicles may converge from both sides of the ship;

crew members should be wary that vehicles may lose control on ramps and sloping deck, especially when wet, and that vehicles on ramps with steep inclines may be susceptible to damage. Ramps should have a suitable slip resistant surface;

where fitted, audible alarms should be sounded by vehicles that are reversing;

safe systems of work should be provided in order to ensure that all vehicle movements are directed by a competent person;

personnel moving about the ship should be aware of moving ramps, moveable decks etc. Where possible such ramps and decks should be fitted with audible and visual alarms.

31.7 Inspection of vehicles

31.7.1 Before being accepted for shipment, every freight vehicle should be inspected externally by a competent and responsible person or persons to check that it is in a satisfactory condition for shipment – for example:

its suitability for securing to the ship in accordance with the approved cargo securing manual (see also 28.1.4);

where practicable, the securing of the load to the vehicle;

a check to ensure the deck or doorway is high enough for vehicles to pass through, and that vehicles have adequate clearance for ramps with steep inclines;

any labels, placards and marks which would indicate the carriage of dangerous goods.

37.7.2 It is important to ensure, so far as is reasonably practicable, that on each vehicle the fuel tank is not so full as to create a possibility of spillage. No vehicle showing visual signs of an overfilled tank should be loaded.

37.7.3 Personnel should be aware of hazardous units as detailed on the stowage plan and indicated by labels, placards and marks, and should be on guard against the carriage of undeclared dangerous goods.

31.8 Stowage

31.8.1 Shippers' special advice or guidance regarding handling and stowage of individual vehicles should be observed.

31.8.2 Vehicles should:

so far as possible, be aligned in a fore and aft direction;

be closely stowed athwartships so that, in the event of any failure in the securing arrangements or from any other cause, the transverse movement is restricted. However, sufficient distance should be provided between vehicles to permit safe access for the crew and for passengers getting into and out of vehicles and going to and from accesses serving vehicle spaces;

be so loaded that there are no excessive lists or trims likely to cause damage to the vessel or shore structures.

31.8.3 Vehicles should not:

be parked on permanent walkways;

be parked so as to obstruct the operating controls of bow and stern doors, entrances to accommodation spaces, ladders, stairways, companionways or access hatches, fire-fighting equipment, controls to deck scupper valves and controls to fire dampers in ventilation trunks;

be stowed across water spray fire curtains, if these are installed.

31.8.4 Safe means of access to securing arrangements, safety equipment, and operational controls should be properly maintained. Stairways and escape routes from spaces below the vehicle deck should be clearly marked with yellow paint and kept free from obstruction at all times.

31.8.5 Parking brakes of each vehicle or each element of a vehicle, where provided, should be applied and the vehicle should, where possible, be left in gear.

31.8.6 Semi-trailers should not be supported on their landing legs during sea transport unless the landing legs are specially designed for that purpose and so marked, and the deck plating has adequate strength for the point loadings.

31.8.7 Uncoupled semi-trailers should be supported by trestles or similar devices placed in the immediate area of the drawplates so that the connection of the fifth-wheel to the kingpin is not restricted.

31.8.8 Drums, canisters and similar thin walled packaging are susceptible to damage if vehicles break adrift in adverse weather, and should not be stowed on the vehicle deck without adequate protection.

31.8.9 Depending on the area of operation the predominant weather conditions and the characteristics of the ship freight vehicles should be stowed so that the chassis are kept as static as possible by not allowing free play in the suspension. This can be done by securing the vehicles to the deck as tightly as the lashing tensioning device will permit or by jacking up the freight vehicle chassis prior to securing or, in the case of compressed air suspension systems, by first releasing the air pressure where this facility is provided.

31.8.10 Since compressed air suspension systems may lose air, adequate arrangements should be made to prevent the slackening off of lashings as a result of air leakage during the voyage. Such arrangements may include the jacking up of the vehicle or the release of air from the suspension system where this facility is provided.

31.9 Securing of cargo

31.9.1 Securing operations should be completed before the ship proceeds to sea.

31.9.2 Within the constraints laid down in the approved cargo securing manual, the master has the authority to decide on the application of securings and lashings and the suitability of the vehicles to be carried. In making this decision due regard shall be given to the principles of good seamanship, experience in stowage, good practice and the IMO Code for Cargo Stowage and Securing (CSS Code).

31.9.3 Personnel appointed to carry out the task of securing vehicles should be trained in the use of the equipment to be used and in the most effective methods for securing different types of vehicles.

31.9.4 Securing operations should be supervised by competent personnel who are conversant with the contents of the Cargo Securing Manual. Freight vehicles of more than 3.5 tons should be secured in all circumstances where the expected conditions for the intended voyage are such that movement of the vehicles relative to the ship could be expected.

31.9.5 During the voyage the lashings should be regularly inspected to ensure that vehicles remain safely secured. Personnel inspecting vehicle spaces during a voyage should exercise caution in order to avoid being injured by moving or swaying vehicles. If necessary, the ship’s course should be altered to reduce movement or dangerous sway when lashings are being adjusted. The officer of the watch should always be notified when an inspection of the vehicle deck is being made.

31.9.6 When wheel chocks are being used to restrain a semi-trailer they should remain in place until the semi-trailer is properly secured to the semi-trailer towing vehicle.

31.9.7 No attempt should be made to secure a vehicle until it is parked, the brakes, where applicable, have been applied and the engine has been switched off.

31.9.8 When vehicles are being stowed on an inclined deck, the wheels should be chocked before lashing commences.

the tug driver should not leave the cab to disconnect or connect the trailer brake lines. A second person should do this;

the parking brake on the tug should be engaged and in good working condition;

as well as wheel chocks, at least two lashings holding the unit against the incline should be left in place until the trailer's braking system is charged and operating correctly.

31.9.9 Where personnel are working in shadow areas or have to go under vehicles to secure lashings, hand lamps and torches should be available for use.

31.9.10 Personnel engaged in the securing of vehicles should take care to avoid injury from projections on the underside of the vehicles.

31.9.11 Wherever possible, lashings should be attached to specially designed securing points on vehicles, and only one lashing should be attached to any one aperture, loop or lashing ring at each securing point.

31.9.12 When tightening lashings, care should be exercised to ensure that they are securely attached to the deck and to the securing points of the vehicle.

31.9.13 Hooks and other devices which are used for attaching a lashing to a securing point should be applied in a manner which prevents them from becoming detached if the lashing slackens during the voyage.

31.9.14 Lashings should be so attached that, provided there is safe access, it is possible to tighten them if they become slack.

31.9.15 Lashings on a vehicle should be under equal tension.

31.9.16 Where practicable, the arrangement of lashings on both sides of a vehicle should be the same, and angled to provide some fore and aft restraint, with an equal number of pulling forward as are pulling aft.

31.9.17 The lashings are most effective on a vehicle when they make an angle with the deck of between 30 and 60 degrees. When these optimum angles cannot be achieved additional lashings may be required.

31.9.18 Crossed lashings should, where practicable, not be used for securing freight vehicles because this arrangement provides no restraint against tipping over at moderate angles of roll of the ship. Lashings should pass from a securing point on the vehicle to a deck securing point adjacent to the same side of the vehicle. Where there is concern about the possibility of low co-efficients of friction on vehicles such as solid wheeled

trailers, additional crossed lashings may be used to restrain sliding. The use of rubber mats should be considered.

31.9.19 Lashings should not be released for unloading before the ship is secured at the berth, without the Master's express permission.

31.9.20 Personnel should release lashings with care to reduce the risk of injury when the tension is released.

31.9.21 To avoid being damaged during loading and unloading all unused securing equipment should be kept clear of moving vehicles on the vehicle deck.

31.9.22 A competent appointed person should inspect securing equipment to ensure that it is in sound condition at least once every six months and on any occasion when it is suspected that lashings have experienced loads above those predicted for the voyage. Defective equipment should be taken out of service and placed where it cannot be used inadvertently. Unused lashing equipment should be securely stowed away from the vehicle deck.

31.10 Dangerous goods

31.10.1 This section should be read in conjunction with Chapter 26: Hazardous Substances. For guidance on dealing with emergencies involving dangerous goods, see Chapter 10: emergency Procedures and the IMDG Code.

31.10.2 Prior to loading, freight vehicles carrying dangerous goods should be examined externally for damage and for signs of leakage or shifting of its contents. Any freight vehicle found to be damaged, leaking or with shifting contents should not be accepted for shipment. If a freight vehicle is found to be leaking after loading, a ship's officer should be informed and personnel kept well clear until it is ascertained that no danger to personnel persists.

31.10.3 Freight vehicles carrying dangerous goods and adjacent vehicles should always be secured.

31.10.4 Tank vehicles, and tank containers on flat-bed trailers, containing products declared as dangerous goods should be given special attention. Pre-voyage booking procedures should ascertain that tanks have been approved for the carriage of their contents by sea.

31.11 Specialised vehicles

31.11.1 Gas cylinders used for the operation and business of vehicles such as caravans should be adequately secured against movement of the ship, with the gas supply cut off for the duration of the voyage. Leaking and inadequately secured or connected cylinders should be refused for shipment.

31.11.2 The following vehicles, trailers and loads should be given special consideration:

tank vehicles or tank containers containing liquids not classified as dangerous goods. These may be sensitive to penetration damage and may act as a lubricant. These vehicles must always be secured;

tracked vehicles and other loads making metal to metal contact with the deck – where possible rubber mats or dunnage should be used;

loads on flat-bed trailers;

vehicles with hanging loads such as chilled meat or floated glass;

partially filled tank vehicles.

31.11.3 Freight vehicles carrying livestock require special attention to ensure that they are properly secured, adequately ventilated and stowed so that access to the animals is possible.

31.11.4 Where vehicles are connected to electrical plug-in facilities, personnel should take the appropriate precautions as described in Chapters 7 and 21 of this Code for working with any electrical equipment.

31.12 Use of work equipment

31.12.1 Ships' ramps, car platforms, retractable car-decks and similar equipment should be operated only by competent persons authorised by a responsible ship's officer, in accordance with the company's work instructions. Safe systems of work should be provided to ensure that the heath and safety of crew or passengers is not put at risk. Ramps etc. should not be operated unless the deck can be seen to be clear of people, and if any person appears on the deck while the ramp is moving, the operations should be stopped immediately.

31.12.2 Training in the use of such equipment should consist of theoretical instruction enabling the trainee to appreciate the factors affecting the safe operation of the plant, and supervised practical work.

31.12.3 Moveable deck ramps should be kept clear of passengers when being raised or lowered. When cars are lowered on the ramps of moveable decks they should be suitably chocked.

31.12.4 No person should be lifted by ramps, retractable car decks or lifting appliances except where the equipment has been designed or especially adapted for that purpose.

31.12.5 Retractable car-decks and lifting appliances should be securely locked when in the stowed position.

31.12.6 After all vehicles have been loaded, the car deck hydraulics should be isolated, so that they cannot be accidentally activated during the voyage, and the bridge should be informed.

31.12.7 The ship's mobile handling equipment, which is not fixed to the ship, should be secured in its stowage position before the ship proceeds to sea.

31.13 Housekeeping

31.13.1 All walkways should be kept clear.

31.13.2 All vehicle decks, ships' ramps and lifting appliances should, so far as is reasonably practicable, be kept free of water, oil, grease or any liquid which might cause a person to slip or which might act as a lubricant to a shifting load. Any spillage of such liquid should be quickly cleaned up; sand boxes, drip trays and mopping up equipment should be available for use on each vehicle deck.

31.13.4 Personnel should be careful to avoid electrical points and fittings when washing down vehicle decks.

31.13.5 All scuppers should be kept clear of lashing equipment, dunnage etc.

Chapter 32 - Port Towage Industry

Application to fishing vessels which operate outside territorial waters
This Chapter does not apply to such ships

Application to ships not subject to SOLAS which go on international voyages
This Chapter applies to such ships

32.1 General

32.1.1 This section covers crews engaged on tugs which are involved in towage operations within port/harbour limits and provides general guidance on safety. Where other documents or sections of this Code apply these are referenced and should be read in conjunction with this Chapter.

32.1.2 Before beginning towing operations, a comprehensive plan of action should be prepared, taking account of all relevant factors, including sea-state, visibility and the findings of the risk assessment.

32.2 Watertight integrity

32.2.1 The watertight integrity of the tug should be maintained at all times. When a tug is engaged on any towage operation all watertight openings should be securely fastened.

32.2.2 All watertight openings should be marked with a sign stating that they are to remain closed during towage operations. Any such openings used whilst moving about the tug during a towage operation should be re-secured immediately after use. Signs should conform with Chapter 27 of this Code.

32.3 Testing and inspection of towing equipment

32.3.1 Towing hooks and alarm bells, if fitted, should be inspected daily.

32.3.2 The emergency release mechanisms on towing hooks and winches should be tested, both locally and where fitted remotely, at frequent intervals to ensure correct operation.

32.3.3 All towing equipment in use should be inspected for damage before undertaking and after completing a tow.

32.4 Connecting and disconnecting the towing gear

32.4.1 Before commencing a tow the master should determine which towing gear is suitable for the operation and instruct the crew accordingly.

32.4.2 When receiving heavy lines, the tug crew should be aware of the risk of injury through being struck by a "Monkey's Fist" or other weighted object attached to the line. They should stand clear of and where possible indicate the area that the heaving line is to be thrown up to.

32.4.3 When connecting to a tow, the crew on deck should ensure that the towing gear is clear of any obstructions, able to run freely and is released from the tug in a controlled manner.

32.4.4 During disconnection, the crew on deck should be aware of the risk of injury if the towing gear is released from the tow in an uncontrolled manner and avoid standing directly below. They should also be aware that any towing gear which has been released and is still outboard may "foul" on the tug's propeller(s), steelworks or fendering, causing it to come tight unexpectedly.

32.5 Use of bridle/gog rope during towing operations

32.5.1 A suitable bridle/gog rope/wire should be used where it is identified, through the position of the tug in assisting the tow or the nature of the operation, that the tow line is likely to reach such an angle to the fore and aft line of the tug that a "girting" situation may arise.

32.6 Crew Safety During Towing Operations

32.6.1 Once the towing gear is connected, the deck crew should indicate this to the master and then clear the area and, if required to remain on deck, stand in a safe position. If the crew are required to attend the towing gear during a towing operation, the length of time exposed should be kept to a minimum.

32.6.2 During towage operations the towing gear, equipment and personnel should be continuously monitored and any change in circumstances immediately relayed to the master. This is particularly important on tugs where the master has a restricted view of those areas/personnel.

32.6.3 During all towing operations, where a tug is made fast to the tow, the crew should be aware that the tow may have to be released in an emergency situation, and that this may occur without any warning.

32.6.4 Tug crews should wear appropriate personal protective equipment – see Chapter 4.

32.7 Communications

32.7.1 Prior to undertaking the tow, relevant information should be exchanged and an effective means of communication established between the tug and the tow. Secondary/alternative means of communication when possible should also be agreed.

32.7.2 Internal communications are equally important and the Tug Master should ensure that the crew are aware of the intended operation, including any special circumstances or instructions, and that an effective means of communication is established between the master and crew during the towing operation.

32.8 Interaction

32.8.1 Interaction and its effects on the tug and its handling are well known and appreciated in port/harbour towage. Masters and crew are reminded that these effects increase with speed.

32.8.2 In areas where interaction exists, and when manoeuvring alongside a tow, the master should be aware of the possibility of underwater obstructions such as bulbous bows, stabiliser fins etc., and areas of the ship's sides, such as pilot doors, which are to be avoided. The use of bow thrusts by the tow may present a hazard to the tug.

32.8.3 When in close proximity to or coming alongside a tow, the crew should be aware of interaction and the effect it may have on the tug. This may take the form of sudden movement or contact and result in loss of balance or movement of equipment and other objects.

32.9 Escorting

32.9.1 Escorting as a regular operation is becoming common within the port towage industry. It should only be carried out after investigating the suitability of the tug for the operation and agreeing a plan. This type of operation is carried out in the "passive" and "active" modes; passive when running free in close attendance and active when fast to the tow. If active escort is being undertaken the form of towage can be "direct" or "indirect", depending on the speed of the tow. When fast, masters should be aware that increased loads can be applied to towing gear, especially when operating in the indirect mode.

APPENDIX 1

STANDARDS SPECIFICATIONS REFERRED TO IN THE CODE, ARRANGED BY CODE CHAPTER

Chapter 4	**Personal Protective Equipment**
4.2.5	CYS EN 136:1998 Respiratory protective devices – Full face masks CYS EN 166: 2001 Personal eye – protection CYS EN 340: 1993 Protective clothing - general requirements CYS EN 345: 1992 Specification for safety footwear for professional use CYS EN 352 parts 1-7 : 2002 Hearing Protectors CYS EN 361: 2002 Full body Harnesses CYS EN 358: 1999 Belts for work positioning and restraint and work positioning lanyards CYS EN 355:2002 Energy absorbers CYS EN 397:1995 Specification for industrial safety helmets. CYS EN 812:1998 Industrial bump caps. CYS EN 420: 1994 General requirements for gloves CYS EN 470-1:1995 Protective clothing for use in welding and allied processes. CYS EN 471: 1994 High Visibility warning clothing
4.8.2	CYS EN 12021-1999 Recommendations for the selection, use and maintenance of respiratory protective equipment
Chapter 5	**Safety Signs**
5.1.1	ISO 3864: 1984 Safety signs and colours
Chapter 14	**Safe System at Work**
14.7.1	CYS EN 349:1973 Safety of machinery.
Chapter 16	**Entering Enclosed or Confined Spaces**
16.13.3a	CYS EN 137:1993 Self-contained open-circuit compressed air breathing apparatus
16.13.3b	CYS EN 139:1995 Compressed air line breathing apparatus.
16.13.3b	CYS EN 1146:1997 Self contained open-circuit breathing apparatus incorporating a hood.
Chapter 17	**Boarding arrangements**
Annex 17.1.3	ISO 7061: 1993 Aluminium shore gangways for sea going vessels

Annex 17.1.4	ISO 5488: 1979 Accommodation ladders
Annex 17.1.6	BS MA 39: Part 2 1973 Ships' ladders , Steel, sloping
Chapter 19	**Use of work equipment**
19.4.1	BS 6500:1990 Insulated flexible cords and cables.
19.12.11	CYS EN 81-1: 1998, Specification for lifts, escalators, passenger conveyors and paternosters.
Chapter 20	**Lifting plant**
20.4.1	BS MA 48:1976 (87) Design and operation of ship's derrick rigs.
Chapter 22	**Hot Work**
22.3.2	CYS EN 169:1992 Specification for filters for personal eye protection equipment used in welding and similar operations.
22.3.3	CYS EN 470-1:1995 Protective clothing for use in welding and allied processes.
22.6.8	CYS EN 60529:1992 Specification for degrees of protection provided by enclosures (IP Code).
22.7.1	ISO 2024:1981 Specification for lined lightweight rubber overshoes and overboots
22.9.14	CYS EN 1256:1996 Specification for hose assemblies for equipment for welding, cutting and allied processes.
Annex 22.2	CYS EN 60974-1: 1998 Arc welding power sources.
Annex 22.3	CYS EN 559:1994 Rubber hoses for welding, cutting and allied processes.
	BS 3212:1991 Flexible rubber tubing, rubber hose and rubber hose assemblies for use in LPG vapour phase and LPG/air installations.
	CYS EN 1256:1996 Specification for hose assemblies for welding, cutting and allied processes.
	CYS EN 561:1995 Quick action coupling with shut off valves for welding, cutting and allied processes.
Chapter 27	**Use of Safety Signs**
27.5.1	CYS EN 1089-3 : 1997 Transportable gas cylinders. Gas cylinder identification, excluding LPG. Colour coding.

27.5.3	CYS EN 850: 1997 Medical gas cylinders, valves and yoke connections.
27.7.1	CYS EN 3 - 1:1996 Portable fire extinguishers.
27.7.4	BS 7863:1996 Recommendations for colour coding to Indicate the extinguishing media contained in portable fire extinguishers.

APPENDIX 2

CYPRUS LEGISLATION CONCERNING SAFETY AND HEALTH AT WORK

A/A	Legislation Title	Code Number	Publication Date	Relevant E.U. Directives or ILO Convnentions
1.	The Safety and Health at Work Laws of 1996-2002	Law 89(I)/1996, Law 158(I)/2001, Law 25(I)/2002, Law 41(I)/2003, Law 99(I)/2003	1.11.1996, 31.12.2001, 29.3.2002, 23.5.2003, 25.7.2003	EU Directive 89/391/EEC ILO Occupational Safety and Health Convention 1981 No 155
2.	The Safety Committees at Work Regulations of 1997	P.I. 134/97	24.4.1997	
3.	The Minimum Requirements for Safety and Health Signs at Work Regulations of 2000	P.I. 212/2000	21.7.2000	EU Directive 92/58/EEC
4.	The Safety and Health at Work (Biological Agents) Regulations of 2001	P.I. 144/2001	6.4.2001	EU Directive 2000/54/EC
5.	The Safety and Health at Work (Carcinogenic and Mutagenic Agents) Regulations of 2001 and 2004	P.I. 153/2001 P.I. 493/2004	6.4.2001 30.4.2004	EU Directives: 90/394/EEC 99/38/EEC 97/42/ECC
6.	The Safety and Health at Work (Manual Handling of Loads) Regulations of 2001	P.I. 267/2001	6.7.2001	EU Directive 90/269/EEC
7.	The Safety and Health at Work (Chemical Agents) Regulations of 2001-2004.	P.I. 268/2001 P.I. 55/2004	6.7.2001 6.2.2004	EU Directives: 98/24/EC, 91/322/EEC, 2000/39/EC
8.	The Minimum Requirements for Safety and Health (Use of Work Equipment at Work) Regulations of 2001 and 2004	P.I. 444/2001 P.I. 497/2004	30.11.2001 30.4.2004	EU Directives: 89/655/EEC 95/63/EC 2001/45/EC
9.	The Minimum Requirements for Safety and Health at Work with Visual Display Screen Equipment Regulations of 2001	P.I. 455/2001	7.12.2001	EU Directive 90/270/EC

A/A	Legislation Title	Code Number	Publication Date	Relevant E.U. Directives or ILO Convnentions
10.	The Minimum Requirements for Safety and Health (Use of Personal Protective Equipment at Work) Regulations of 2001	P.I. 470/2001	14.12.2001	EU Directive 89/656/EEC
11.	The Management of Safety and Health Issues at Work Regulations of 2002	P.I. 173/2002	5.4.2002	EU Directive 89/391/EEC
12.	The Safety and Health at work of workers with fixed-duration employment or temporary employment Regulations of 2002	P.I. 184/2002	12.4.2002	EU Directive 91/383/EEC
13.	The Safety and Health at Work (Protection from Noise) Regulations of 2002	P.I. 230/2002	10.5.2002	EU Directive 86/188/EEC
14.	The Safety and Health at Work (Minimum Requirements for the Protection of Persons at Work from Risks from Explosive Atmospheres) Regulations of 2002	P.I. 291/2002	21.6.2002	EU Directive 1999/92/EC
15.	The Merchant Shipping (Minimum Requirements on Safety and Health at Work on Board Cyprus Fishing Vessels) Law of 2002	Law 160(I)/2002	9.8.2002	EU Directive 93/103/EEC
16.	The Merchant Shipping (Minimum Requirements on Medical Treatment on Board Vessels) Law of 2002	Law 175(I)/2002	27.9.2002	EU Directive 92/29/EEC
17.	The Factories Laws of 1957 -1996	Cap. 134, Law 43/64, Law 32/72, Law 22/82, Law 25/89, Law 20/90, Law 220/91, Law 90(I)/96	22.12.1956, ---.---.1964, 19.5.1972, 7.5.1982, 24.2.1989, 2.3.1990, 13.12.1991, 1.11.1996	

A/A	Legislation Title	Code Number	Publication Date	Relevant E.U. Directives or ILO Convnentions
18.	The Standards for Health Provisions (in Factories) Regulations of 1973 to 2002	P.I. 312/73 P.I. 165/81 P.I. 40/86 P.I. 225/2002	28.12.1973 24.7.1981 21.2.1986 10.5.2002	
19.	The Control of Factory Atmosphere and Dangerous Substances in Factories Regulations of 1973 to 1986	P.I. 311/73 P.I. 166/81 P.I. 41/86	1973 24.7.1981 21.2.1986	
20.	The Woodworking Machinery Regulations of 1973 and 1988	P.I. 279/73 P.I. 311/88	23.11.1973 23.12.1988	
21.	The Electricity in Factories Special Regulations of 1981 and 1983	P.I. 315/81 P.I. 84/83	11.12.1981 8.4.1983	
22.	The Occupational Safety and Health in Dockwork Regulations of 1991	P.I. 349/91	13.12.1991	ILO Occupational Safety and Helath (Dock Work) Convention of 1979 No152
23.	The Standards for Health Provisions in Factories (Amendment) Regulations of 2002			
24.	The Asbestos (Safety and Health of Persons at Work) Laws of 1993 - 2000	Law 23(I)/93, Law 47(I)/2000	14.5.1993, 14.4.2000	EU Directive 83/477/EC and ILO Asbestos convention of 1986 No162
25.	The Asbestos (Safety and Health of Persons at Work) Regulations of 1993 - 2004	P.I. 272/93, P.I. 104/2000, P.I. 495/2004	19.11.1993, 21.4.2000, 30.4.2004	EU Directive 83/477/ECC and ILO Asbestos convention of 1986 No. 162
26.	The Accidents and Occupational Diseases (Notification) (Dangerous Occurrences) Law of 1953		29.10.1953	
27.	The Protection of Young Persons at Work Law of 2001	Law 48(I)/2001	6.4.2001	EU Directive 94/33/EEC
28.	The Maternity Protection Laws of 1997 - 2002	Law 100(I)/97, Law 45(I)/2000, Law 64(I)/2002	19.12.1997, 7.4.2000, 31.5.2002	EU Directive 92/85/EEC
29.	The Maternity Protection (Safety and Health at Work) Regulations of 2002	P.I. 255/2002	31.5.2002	EU Directive 92/85/EEC
30.	Legislation under preparation (Vibration)			2002/44/EC

A/A	Legislation Title	Code Number	Publication Date	Relevant E.U. Directives or ILO Convnentions
31.	Legislation under preparation (Noise)			2003/10/EC

APPENDIX 3
GUIDELINES ON FOOD AND WATER

Application to fishing vessels which operate outside territorial waters
Application to ships not subject to SOLAS which go on international voyages
This Appendix applies to such ships

The Convention on Merchant Shipping (Minimum Standards) of 1976 (Ratification) and Matters Connected Therewith Law of 1995 implements ILO Convention No. 68 on Food and Catering (Ships' Crews) of 1946. Section 17 provides for the seafarer's right for food and drinking water on board ship. Section 18 requires the shipowner and master to make arrangements to ensure that –

(a) the food and water supplies, taking into account the size of the crew and the duration and nature of the voyage, are suitable in respect of quantity, nutritive value, quality and variety (taking into account also the nationality of the crew);
(b) the equipment and arrangement of the catering department are such that the provision of proper meals to the crew is permitted; and
(c) during the preparation and serving of meals the basic rules of cleanness and hygiene are followed.

These Guidelines provide advice as to how those responsibilities should be met. They are applicable Guidelines under the International Safety Management Code (ISM Code).

Application

These Guidelines apply to all sea-going Cyprus ships.

Food and water – a balanced diet

Sufficient food and water should be provided so as to ensure a balanced diet. A balanced diet is achieved through the provision of a variety of foods from each of the four food groups every day. The groups are;

bread and other cereals;
fruit and vegetables;
milk and dairy products; and
meat, fish and alternatives.

Note that the quantities given in the sections below are the minimum that should be provided, and that depending on the circumstances higher quantities may be needed.

Foods in a fifth group, i.e. foods containing fats and foods containing sugar can be eaten sparingly as part of a healthy balanced diet but should not be provided instead of foods from other food groups.

Fruit and vegetables.

Fresh, frozen, dried and canned fruit and vegetables all count. Pulses (peas, beans, lentils etc.) also contribute to this group. A wide variety and at least five portions a day should be provided. A portion is approximately 80 g. Pulses only count once to this group per day, even if served more than once.

Breads, other cereals and potatoes.

Bread, potatoes, yams, breakfast cereals, pasta, rice, oats, noodles, maize, and millet all contribute to this group. A third of daily food intake should be from foods in this group with at least one food from each group at each meal.

Milk and dairy products.

Milk, cheese, yogurt and calcium fortified soya contribute to this group. Two to three servings should be provided each day. A 200 ml glass of milk or 30 g of cheese provides a serving.

Meat, fish and alternatives.

Meat, poultry, fish and eggs contribute to this group. Alternatives include nuts, tofu, textured vegetable protein and pulses.

A daily portion of this group of at least 150 g should be provided.

If appropriate, two portions of fish, one an oily fish, should be provided weekly; red meat (meat from cattle or sheep) should not be provided more than a few times a month.

Foods containing fats and foods containing sugars.

Margarine, butter, cooking oils, mayonnaise, fried foods, chocolate, cakes, pastries and ice cream all contribute to this group. It is essential to have small amounts of fats and oils in the diet but they should be eaten sparingly. Limit the consumption of saturated fats. Provide fats and oils containing monounsaturates (e.g. olive and rapeseed oils) and polyunsaturates (e.g. sunflower and rapeseed oils) instead of saturates. There are two types of essential fats which must be provided by the diet in small amounts; omega-3 fatty acids (e.g. those found in oily fish, walnuts, rapeseed and soya oil) and omega-6 fatty acids (e.g. those found in vegetable oils). Sugar adds sweetness and taste but too frequent consumption should be avoided.

Fluids.
The amount of fluid required varies from person to person. Age, climate, and physical activity all have an influence. Intakes of 1.5 to 2 litres per day are recommended for temperate climates, considerably more for hot climates.
Energy Content.

Age, climate and particularly physical activity all have an influence. As a guide 1500 to 1800 calories each day are required for a person engaged in sedentary work whilst 2500 to 2800 calories are required for a person engaged in heavy physical activity.

Further advice

Further advice is available on the Internet, from –

http://www.pueblo.gsa.gov/cic_text/food/dietguide2000/diet-guide.pdf
(US Government dietary guidelines)

http://www.nut.uoa.gr/english/Greekguid.htm
(Greek Government dietary guidelines for adults in Greece)

Food storage

1. Food, other than food prepared for rapid use, should not be left unstored at temperatures between 5^{o} C and 63^{o} C.

2. (a) Raw food must be kept apart from cooked food or foods that need further treatment before consumption.
   (b) If separate refrigerators are not provided, raw food should be placed at the bottom of the refrigerator to prevent drips.
   (c) All food should be covered or wrapped.

3. Dry food stores should be dry, cool, well lit and ventilated.

4. Thermometers should be easily visible to persons working in passageway serving the refrigerated spaces.

5. The temperature of deep-freezer compartments should, so far as possible, be kept at -18^{o} C or below.

Water

1 Potable water should be bright, clear, virtually colourless and it should bubble when shaken.

2. Only clean hoses, dedicated to the purpose, should be used. Hoses should be flushed through before use and fitted with collars to prevent their connections from coming into contact with the ground or deck.

3 Dedicated fresh water hoses should be superchlorinated at 100ppm for a period of one hour at least once every six months.

4 All fresh water taken from shore should be chlorinated on loading to ensure a residual free chlorine content of 0.2ppm, unless an automatic chlorination unit is used. Concentration levels should be checked.

5 Chlorine tests of taps and shower outlets should be carried out at monthly intervals.

6 Storage tanks should be opened up, emptied, ventilated and inspected at intervals not exceeding 12 months for inspection and maintenance. Tanks should be thoroughly cleaned, recoated as necessary and flushed out.

7. Hoses should be drained, capped and properly stored between use. Deck filling points should be protected and secured with covers.

Condition of Galley

1. The galley should be equipped, illuminated and maintained in such a way as to ensure good sanitation.

2. The equipment should be made of corrosion resistant, non-toxic materials that are easy to clean.

3. All galley areas, especially cooking areas, should be protected against fire, easy to clean, and capable of being rapidly emptied of smoke, steam, odours and gases.

4. Ventilation hoods and grease filters should be cleaned on a regular basis.

5. Waste, particularly food scraps, should be kept in sturdy, tightly covered garbage cans. Waste disposal units should be kept clean and tidy.

6. Where possible, all galley equipment and utensils should be fixed in place. Non-fixed utensils should be hung or stored.

7. Foodstuffs, supplies, cookware, crockery and utensils should be thoroughly cleaned after each use and stored in containers that can be secured when the items in question are not in use.

8. (a) There should be separate work surfaces for the preparation of raw meat, or, if space is restricted, a separate chopping board.
(b) The board used for raw meat should be clearly distinguishable to avoid confusion.
(c) If the same board is used for raw or cooked meats, then suitable cleaning and disinfection should be carried out between operations.

9. Mechanical ventilation should be used, and should be adequate to maintain a reasonable temperature.

10. Facilities should be provided in or near the galley area for washing hands, consisting at least of hot water, soap and disposable towels or other hygienic drying facilities.

Vermin

1. If cockroaches, mice, flies or other vermin are evident, immediate action to eliminate or control the problem should be taken.

2. Insecticides and rodent killers should not be stored in or immediately adjacent to spaces used for storage, handling, preparation and serving of food and drink, or for the storage or cleaning of dishes and equipment.

Bacterial contamination

1. Bacterial contamination is the most serious risk to food safety. Contaminated food looks, tastes and smells completely normal and causes the vast majority of food poisoning cases. Contamination usually occurs through ignorance and food handlers taking short cuts.

2. Food poisoning bacteria are found everywhere. Sources include people, insects, rodents, refuse and waste food, even dust. Bacteria prefer warm, moist environments and if food is incorrectly stored and insufficient care is taken during its preparation, harmful bacteria will multiply rapidly. Even if food is stored and cooked properly, it can still be cross-contaminated with bacteria from raw food if for instance the same utensils or surfaces are used to prepare both.

3. “High risk” foods, those most commonly implicated in food poisoning cases, are cooked foods or products not requiring further processing such as cooked meat and poultry, meat products, gravy and stock, milk, cream, eggs, egg products.

4. Although raw meat often carries harmful bacteria and is a source of contamination, a rare steak is safe because bacteria are only present on the surface of meats. On the other hand, hamburgers and other products made from minced meat require thorough cooking as any harmful bacteria that were present on the surface have been distributed throughout the mass of the meat.

5. No catering environment can operate without harmful bacteria being present at some time, but small numbers of most types of bacteria do not cause illness. The storage, preparation and serving of food should therefore only be carried out where the conditions are such that bacteria are denied favourable conditions for growth and the food is not exposed to the contamination risk.

6. Food should be covered wherever possible to prevent cross-contamination and absorption of odour.

7. The 10 main reasons for food poisoning are:
    1. Preparation of food too far in advance and stored at room temperature.
    2. Cooling food too slowly prior to refrigeration.
    3. Not reheating food to high enough temperatures to destroy harmful bacteria.
    4. Using contaminated cooked food.

5. Undercooking.
6. Not thawing frozen meat for sufficient time.
7. Cross contamination from raw food to cooked food.
8. Storing hot food below 63°C.
9. Infected food handlers.
10. Improper use of leftovers.

Personal hygiene

1. Most people carry some type of food poisoning organism at one time or another. Food handlers have a responsibility therefore to observe high standards of personal cleanliness to ensure that they do not contaminate food.

2. There must be sufficient wash-hand basins in the galley with soap and hand drying facility,depending on the scale and nature of the food preparation. Very small galleys may be exempt so long as a wash-hand basin is situated adjacent to the galley. Disposable towels or a hot air dryer are better than a traditional towel. Food handlers should wash their hands regularly and always on entering the galley or before handling any food or equipment. They should also wash their hands after visiting the WC, and in between handling raw and cooked food.

3. Toilets with wash-hand basins should be situated near to, but separate, from galley. Prominent signs about washing hands should be displayed.

4. Food handlers should avoid so far as possible direct contact between hands and food using tongs for example. Protective gloves may be worn but they can give a false sense of security.

5. Cuts, spots, sores etc should be completely covered by coloured (blue or green) waterproof dressings.

6. Food handlers should be clean and tidy and wear appropriate protective clothing (to protect the individual and the food).

Fitness to work

Food handlers with food poisoning symptoms, eg diarrhoea and vomiting or suspected of carrying food poisoning organisms because of close contact with a confirmed case should be excluded from any job which might expose food to risk of contamination. Such cases and several other conditions including hepatitis “A” and diphtheria require infected persons to be similarly excluded for varying lengths of time according to medical advice. Secondary infections associated with boils and septic cuts, respiratory infections from heavy colds may also require the suspension of food handlers until successfully treated.

Stock control

1. Great care should be taken to ensure the use of commodities in strict date rotation and that supplies have the best possible durability date. Perishable provisions should neither

be ordered nor accepted in quantities greater than can be consumed before the expiry date, with the exception of frozen foods. Provided these have been maintained in hard frozen condition from production to delivery and during storage on board ship, they may be accepted for use beyond the date marking. On some ships there may be a local colour coding system or something similar to further assist staff to quickly recognise out of date stock.

2. Daily checks should be made on short-life perishable food such as fresh fruit and vegetables. Ships should have adequate storage facilities for all stores including cold stores. If storage areas are inadequate, stock levels should be reduced by taking on stores more frequently or if that is not possible, additional storage should be made available. Food should not be stored on the deck.

Sanitary facilities

Sanitary accommodation should be easily cleaned and impervious to damp and properly drained with sufficient light, heat, ventilation and hot and cold water. WCs should have an ample flush of water, available at all times and independently controlled. Shower heads should be cleaned in a chlorine solution (50ppm) every 3 months.

Health and safety issues

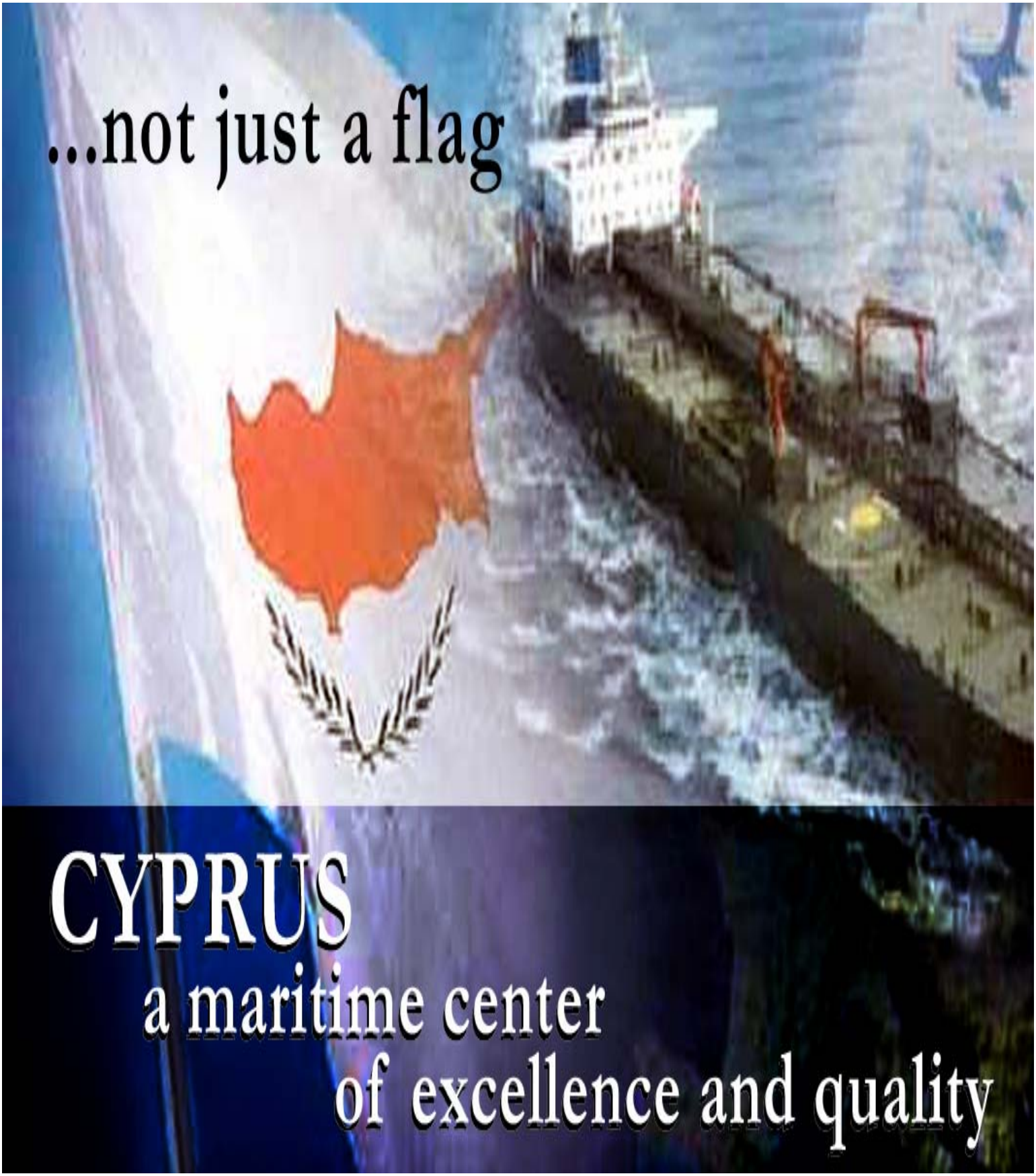
1. There are obvious hazards within the galley and store areas, such as wet greasy deck, extreme high temperatures and humidity, congestion, particularly around the hot plate area, cleaning materials, electrical, fumes, knives, equipment such as deep fat fryers, brat pans and tilting kettles.

2. Electrical equipment, including wiring in galley and store areas should be regularly inspected by a qualified member of the crew. Mechanical fans and other kitchen equipment exposing blades and other dangerous parts should have suitable protective guards. Extreme care should be exercised at all times.

3. Arrangements should be made for the segregation and disposal of garbage, food waste and other galley waste to maintain operational health and safety standards.

4. Burns and scalds are common injuries in catering environments. A first-aid box should therefore be located either in the galley or a suitable area convenient to the galley. It is further recommended that a notice stating the action to take if someone is burned or scalded should be prominently displayed in the galley.

5. Detailed advice specific to galley operations is available in Chapter 13 of the Code of Safe Working Practices for Seafarers.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