

**THE SAFETY OF SMALL WORKBOATS
& PILOT BOATS -**

A CODE OF PRACTICE

READY FOR PUBLICATION

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**THE SAFETY OF SMALL WORKBOATS
& PILOT BOATS -**

A CODE OF PRACTICE

**CODE OF PRACTICE FOR THE CONSTRUCTION,
MACHINERY, EQUIPMENT, STABILITY, OPERATION,
MANNING, EXAMINATION, CERTIFICATION AND
MAINTENANCE OF VESSELS OF UP TO 24 METRES LOAD
LINE LENGTH WHICH ARE**

**IN COMMERCIAL USE FOR THE CARRIAGE OF CARGO
AND/OR NOT MORE THAN 12 PASSENGERS OR NEITHER
CARGO NOR PASSENGERS;**

AND

PILOT BOATS.

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1 FOREWORD

1.1 The Code has been developed for application to small United Kingdom vessels of up to 24 metres load line length which are either vessels in commercial use (other than for sport or pleasure) at sea and which carry cargo and/or not more than 12 passengers or provide a service in which neither cargo nor passengers are carried, or are United Kingdom pilot boats.

1.2 The Code is an acceptable Code of Practice for application to vessels in accordance with the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998, as an equivalent to the Merchant Shipping legislation which applies to them.

In the case of United Kingdom pilot boats, the Code applies to them. There is no equivalent Merchant Shipping legislation.

(The Merchant Shipping (Pilot Boats) Regulations 1991, SI 1991 No.65, have been revoked.)

1.3 On the date of coming into force of the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998 seagoing workboats which do not carry cargo and which were previously exempt from load line certification should comply either in with the phasing-in arrangements in accordance with this Code of Practice or the Merchant Shipping (Load Line) Regulations 1997 (see 3.1.3).

The vessels affected were previously included in a list of specified classes of vessels which were exempted from the provisions of load line regulations and certification. (In all cases, the specified vessels are under 80 tons register (net tons) and engaged solely in the coasting trade (in United Kingdom waters) while not carrying cargo.)

The specified class which is referred to in this case was "ships carrying not more than 12 passengers on a voyage in the course of which they are at no time more than 3 miles from land nor more than 15 miles from their point of departure, unless the point of departure lies within category A, B, C or D waters when the distance of 15 miles shall be measured from the seaward boundary of such limits".

1.4 Small vessels which are in use at sea for commercial sport or pleasure activities and which carry up to 12 passengers but do not carry cargo are covered by certification issued under the Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations 1997. Codes of Practice for small vessels enabled by those Regulations are:-

The Safety of Small Commercial Motor Vessels; and
The Safety of Small Commercial Sailing Vessels;

1.5 Seagoing police boats should be surveyed and certificated in accordance with the "Code of Practice for all Police Craft" published by the General Purposes and Marine Subcommittee of the Association of Chief Police Officers, and which is covered by the General Exemption issued on behalf of the Secretary of State.

1.6 The organisations involved in the development of this Code were as follows:-

American Bureau of Shipping
Association of District Councils
British Marine Industries Federation
British Motor Ship Owners Association
British Ports Association
British Waterways Board
Bureau Veritas
Burness Corlett & Partners Limited
Goodway Sea School
Marine Engineers Certifying Authority Limited
Ministry of Defence
National Federation of Charter Skippers
National Workboat Association
Professional Boatmans Association Limited
Royal Institution of Naval Architects
Scottish Salmon Growers Association
Shellfish Growers Association
Shipbuilders and Repairers Association
Society of Consulting Marine Engineers and Ship Surveyors
South West Ports Association
Trinity House Lighthouse Service
UK Major Ports Group
UK Pilots Association (Marine)
Yacht Brokers Designers & Surveyors Association

1.7 The primary aim in developing the Code has been to set standards of safety and protection for all on board. The level of safety it sets out to achieve is considered to be commensurate with the current expectations of seafarers and passengers. The Code relates especially to the construction of a vessel, its machinery, equipment and stability and to the correct operation of a vessel so that safety standards are maintained.

1.8 The existing code for commercially operated pleasure vessels (see 1.4), "The Safety of Small Commercial Motor Vessels - A Code of Practice", was used as a basis for this code. For vessels operating in the same area with equivalent pay loads it is intended that the standards should be similar. It is also the intention that where vessels have more than one operating mode that full recognition should be given to any examination carried out for the other mode.

- 1.9 The Code deals with manning and the qualifications needed for the senior members of the crew. (Section 26 and Annex 11.)
- 1.10 Designers and builders of new vessels will need to pay special regard to the intended area of operation and the working conditions to which a vessel will be subjected when selecting the materials and equipment to be used in its construction.
- 1.11 The builder, repairer and owner/managing agent of a vessel, as appropriate, should take all reasonable measures to ensure that a material or appliance fitted in accordance with the requirements of the Code is suitable for the purpose, having regard to its location in the vessel and the area of operation of the vessel and the weather conditions which may be encountered.
- 1.12 The general mutual recognition clause adopted by the contracting parties to the European Economic Area Agreement should be accepted. The clause states:-
- Any requirement for goods or materials to comply with a specified standard should be satisfied by compliance with:-
- .1 a relevant standard or code of practice of a national standards body or equivalent body of a Member State of the European Economic Area Agreement; or
 - .2 any relevant international standard recognised for use in any Member State of the European Economic Area Agreement; or
 - .3 a relevant specification acknowledged for use as a standard by a public authority of any Member State of the European Economic Area Agreement; or
 - .4 traditional procedures of manufacture of a Member State of the European Economic Area Agreement where these are the subject of a written technical description sufficiently detailed to permit assessment of the goods or materials for the use specified; or
 - .5 a specification sufficiently detailed to permit assessment for goods or materials of an innovative nature (or subject to innovative processes of manufacture such that they cannot comply with a recognised standard or specification) and which fulfil the purpose provided by the specified standard; provided that the proposed standard, code of practice, specification or technical description provides, in use, equivalent levels of safety, suitability and fitness for purpose.

- 1.13 It is important to stress that, whilst all reasonable measures have been taken to develop standards which will result in the production of safe and seaworthy vessels, total safety at sea can never be guaranteed. As a consequence, it is most strongly recommended that the owner/managing agent of a vessel should take out a policy of insurance for all persons who are part of the vessel's complement from time to time. Such insurance should provide cover which is reasonable for claims which may arise. If a policy of insurance is in force, a copy of the certificate of insurance should be either displayed or available for inspection by persons on board the vessel.
- 1.14 Compliance with the Code in no way obviates the need for vessels and/or skippers to comply with local requirements where these are applied under relevant legal authority.
- 1.15 Recognising that some vessels operate across the margins of the sea into inland waterways, attention is drawn to the common approach to vessel safety adopted by the major UK inland navigation authorities. The Boat Safety Scheme of the British Waterways Board/Environment Agency (BWB/EA) sets safety standards and certification and inspection requirements. Owners/managing agent(s) of vessels complying with this Code and requiring them to operate in inland waterways should obtain formal clearance from the appropriate inland navigation authority.
- 1.16 The owner/skipper of a vessel is responsible for the health and safety of anyone working on the vessel. When the owner/skipper employs crew, the Merchant Shipping health and safety regulations apply.

Every employer should be aware of any risks affecting workers and ensure that appropriate measures are taken to minimise them, through improving procedures or equipment where necessary. Employers should instruct those affected about the risks and how to ensure their own safety and the safety of others.

DEFINITIONS

In the Code :-

"Accommodation space" means any space, enclosed on all six sides by solid divisions, provided for the use of persons on board;

"Annual examination" means a general or partial examination of the vessel, its machinery, fittings and equipment, as far as can readily be seen, to ascertain that it has been satisfactorily maintained as required by the Code and that the arrangements, fittings and equipment provided are as documented in the appropriate form(s). The hull of the vessel should be examined out of the water at intervals not exceeding 3 years. The Certifying Authority may stipulate a lesser interval in consideration of hull construction material or the age or the type and service of the vessel;

"Approved" means approved by or acceptable to the Marine and Coastguard Agency under Merchant Shipping legislation, unless otherwise specified in this Code.

"Authorised person" means a person who by reason of relevant professional qualifications, practical experience or expertise is authorised by the Certifying Authority chosen by the owner/managing agent from those listed in the Code to carry out examinations required under Section 27 of the Code;

"Cargo" for the purpose of this Code means all items which are transported by the vessel except fuel for the vessel, ballast (either solid or liquid), consumables to be used onboard, permanent outfit and equipment of the vessel, stores and spare gear for the vessel, crew and their personal baggage and passengers and their personal baggage;

"Category C waters" means waters designated category C waters in the Merchant Shipping (Categorisation of Waters) Regulations 1992, SI 1992 No.2356 and Merchant Shipping Notice No. M.1504 - Categorisation of waters: passenger ships Class 4 and Class 5;

"Category D waters" means waters designated category D waters in the Merchant Shipping (Categorisation of Waters) Regulations 1992, SI 1992 No.2356 and Merchant Shipping Notice No. M.1504 - Categorisation of waters: passenger ships Class 4 and Class 5;

"Certificate" means the certificate appropriate to the vessel to which the Code is applied;

"Certifying Authority" means either the Maritime and Coastguard Agency or one of the organisations authorised by the Maritime and Coastguard Agency to:-

- (a) appoint persons for the purpose of examining vessels and issuing and signing Declarations of Examinations; and

(b) issue Certificates.

The organisations so authorised by the Maritime and Coastguard Agency for all vessels covered by the Code, including dedicated pilot boats are:-

American Bureau of Shipping
Bureau Veritas
Burness Corlett & Partners Limited
Det Norske Veritas
Germanischer Lloyd
Lloyd's Register of Shipping
Marine Engineers Certifying Authority Limited
Registro Italiano Navale (RINA)
Royal Yachting Association
Society of Consulting Marine Engineers & Ship Surveyors
Yacht Brokers, Designers & Surveyors Association

"Charter" means an agreement between the owner/managing agent and another party which allows that other party to operate the vessel, and the "Charterer" is that other party;

"Code" means this Code, unless another Code is specified;

"Competent Authority" in respect of manning qualifications (Annex 11) means either the Marine Safety Agency or an organisation that issues Certificates of Competence which has applied for and been granted recognition by the Maritime and Coastguard Agency as having the appropriate technical and administrative expertise;

"Competent harbour authority" means a body which as a competent harbour authority responsible for the purposes of the Pilotage Act 1987 c. 21;

"Compliance examination" means an examination of the vessel, its machinery, fittings and equipment, by an authorised person to ascertain that the vessel complies with the requirements of the Code. At least part of the examination should be conducted when the vessel is out of the water;

"Control position" means a position which is continuously manned whilst the vessel is under way or when the vessel is anchored or moored in the course of its commercial activity. (A vessel may have more than one control position e.g. the navigating/helmsman's position and a machinery control position.);

"Crew" means a person employed or engaged in any capacity on board a vessel on the business of the vessel;

"Daylight" means one hour before sunrise until one hour after sunset;

"Decked vessel" means a vessel with a continuous watertight weather deck which extends from stem to stern and has positive freeboard throughout, in any condition of loading of the vessel;

"Efficient" in relation to a fitting, piece of equipment or material means that all reasonable and practicable measures have been taken to ensure that it is suitable for the purpose for which it is used;

"Existing vessel" means a vessel which is not a new vessel;

"Favourable weather" with respect to a small vessel means conditions existing throughout a voyage or excursion in which the effects either individually or in combination of swell, height of waves, strength of wind and visibility cause no hazard to the safety of the vessel, including handling ability. (In making a judgement on favourable weather the skipper should have due regard to official weather forecasts for the service area of the vessel or to weather information for the area which may be available from the Coastguard or similar coastal safety organisation);

Forms used by the Certifying Authorities are typically:-

For workboats:-

Application for survey (or examination);
Surveys for freeboard (freeboard computation);
Compliance examination and declaration;
Details of freeboards to be marked.

For pilot boats:-

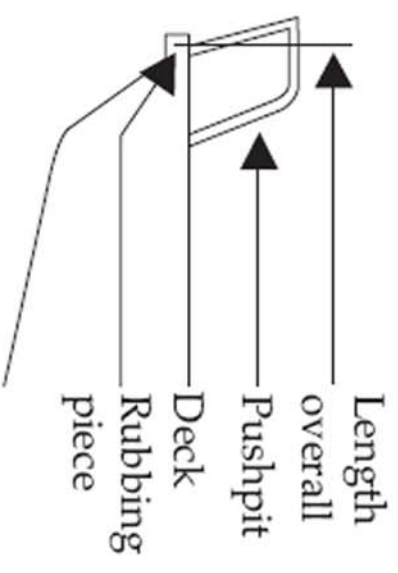
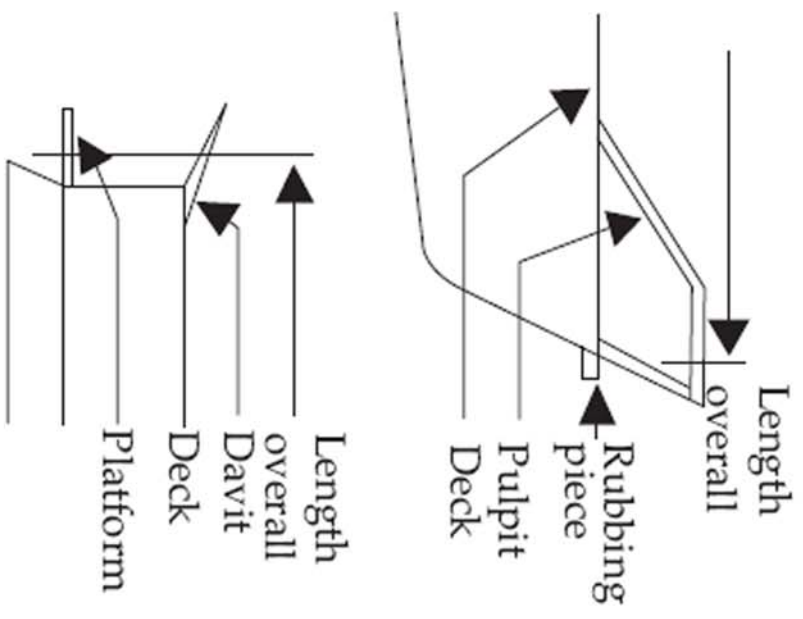
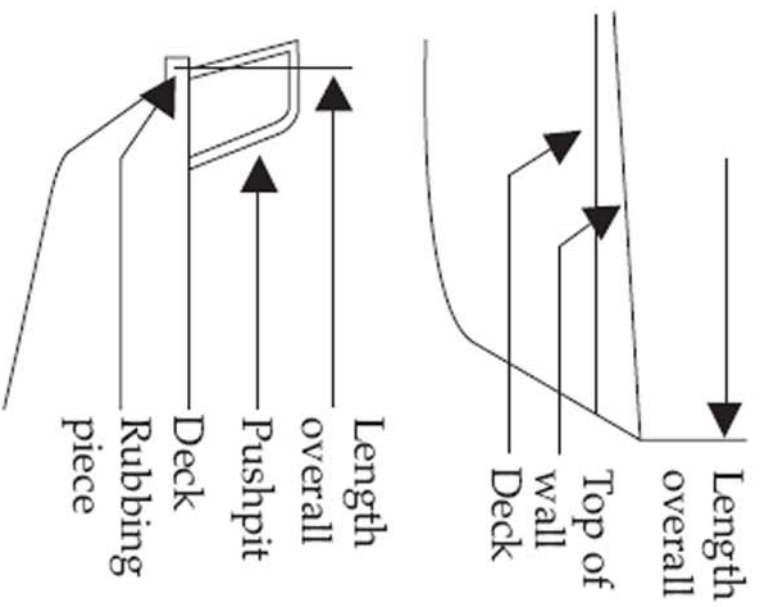
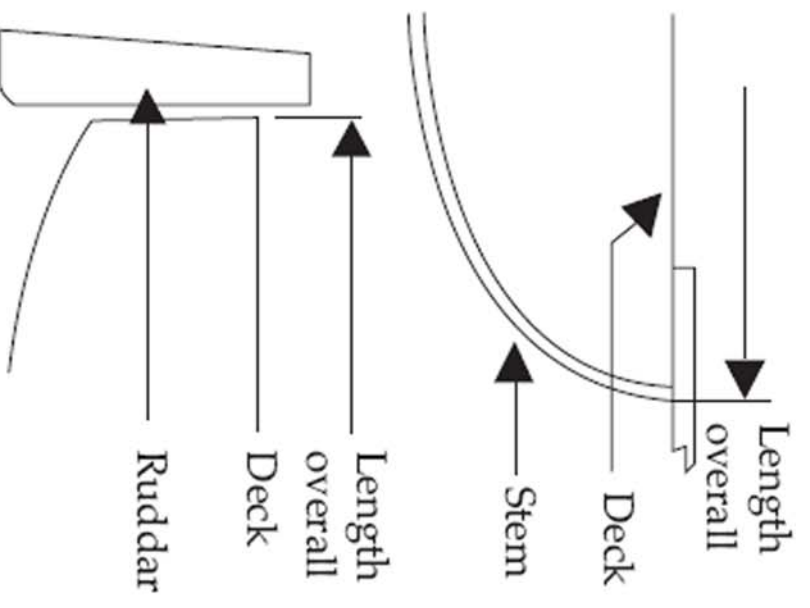
Application for survey (or examination);
Record of particulars of a pilot boat;
Declaration of survey.

"Freeboard" means the distance measured vertically downwards from the lowest point of the upper edge of the weather deck to the waterline in still water;

"Height of side" with respect to an open boat means the distance between the waterline and the lowest point of the gunwale. The clear height should be measured to the top of the gunwale or capping or to the top of the wash strake if one is fitted above the capping;

"Land" means the sea shore above the line of mean high water mark;

"Length" means the overall length from the foreside of the foremost fixed permanent structure to the aftside of the aftermost fixed permanent structure of the vessel;



"Load Line length" means either 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or the length from the fore side of the stem to the axis of the rudder stock on that waterline, whichever is the greater. In a vessel designed with a rake of keel, the waterline on which this length is measured should be parallel to the design waterline ;

"Maritime and Coastguard Agency" means the Maritime and Coastguard Agency, an executive agency of the Department of the Environment, Transport and the Regions ;

"Member State of the European Economic Area Agreement" means a State which is a contracting party to the Agreement on the European Economic Area signed at Oporto on 2 May 1992, as adjusted by the Protocol signed at Brussels on 17 May 1993;

"Merchant Shipping Act", "Merchant Shipping Order", "Merchant Shipping Regulations" and "Merchant Shipping Rules" referred to in the Code mean the reference specified and includes any document issued under the appropriate statutory power which either amends or replaces the reference specified;

"Merchant Shipping Guidance Notice" and "Merchant Shipping Notice" mean a Notice described as such and issued by the Marine and Coastguard Agency and, reference to a specific Notice includes reference to any Notice amending or replacing that Notice which is considered by the Secretary of State to be relevant from time to time and is specified in a Notice;

"Mile" means a nautical mile of 1852 metres;

"Motor vessel" means a power driven vessel which is not a sailing vessel;

"Multihull vessel" means any vessel which in any normally achievable operating trim or heel angle, has a rigid hull structure which penetrates the surface of the sea over more than one separate or discrete area;

"New vessel" means a vessel to which this Code applies, the keel of which was laid or the construction or lay-up was started on or after the first day on which the Code comes into force (see 3.1.3);

"Open boat" for the application of this Code means a vessel which within its length is:-

not fitted with a watertight weather deck; or

fitted with a watertight weather deck over part of its length; or

fitted with a watertight weather deck over the whole its length but the freeboard to the deck does not meet the minimum requirement for freeboard (Section 12);

"Owner/managing agent" means the registered owner or the owner or managing agent of the registered owner or owner ipso facto, as the case may be, and "Owner(s)/managing agent(s)" should be construed accordingly;

"Passenger" means a person carried in a vessel except:-

- (a) a person employed or engaged in any capacity on board the vessel on the business of the vessel;
- (b) a person on board the vessel either in pursuance of the obligation laid upon the skipper to carry shipwrecked, distressed or other persons, or by reason of any circumstances that neither the skipper nor the owner nor the charterer (if any) could have prevented; and
- (c) a child under one year of age.

Reference should be made to Annex 1, which is the text of Merchant Shipping Notice No. M.1194 - The status of persons carried on United Kingdom ships;

"Person" means a person over the age of one year;

"Pilot boat" means a boat employed or intended to be employed in pilotage services; and "Dedicated pilot boat" means a vessel used, or intended to be used, solely as a pilot boat. Occasional use of a dedicated pilot boat to carry personnel, mail and/or small quantities of stores to or from vessels in the pilotage district may be considered compatible with the vessel use as a dedicated pilot boat.

"Pleasure vessel" means a vessel so defined in the Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations 1993, SI 1993 No.1072;

"Protected waters" for the purpose of this Code means waters not categorised in the Merchant Shipping (Categorisation of Waters) Regulations 1992 and Merchant Shipping Notice No. M.1504 - Categorisation of waters: passenger ships Class 4 and Class 5, but the location of which are explicitly defined and accepted as protected by the Regional Chief Surveyor of the Maritime and Coastguard Agency responsible for the specified United Kingdom coastal area, having regard for the safety of the small vessels which operate in those waters;

"Recess" means an indentation or depression in a deck and which is surrounded by the deck and has no boundary common with the shell of the vessel;

"Safe haven" means a harbour or shelter of any kind which affords safe entry and protection from the force of weather;

"Sailing vessel" means a vessel which is designed to be navigated under wind power alone and for which any motor provided is an auxiliary means of propulsion and/or which possesses a non-dimensional ratio of (sail area) divided by (volume of displacement)^{2/3} of more than 9;

"Small vessel" means a vessel of less than 24 metres in load line length;

Standards such as BS (British Standard), EN (European Standard accepted by the European Committee for Standardization, CEN), IEC (International Electrotechnical Commission) and ISO (International Organization for Standardization) identified in the Code should include any standards which amend or replace them;

"To sea" means beyond category D waters, or category C waters if there are no category D waters;

"United Kingdom vessel" means a vessel as defined in chapter 21, section 85(2) of the Merchant Shipping Act 1995;

"Watertight" means capable of preventing the passage of water in either direction;

"Weather deck" means the main deck which is exposed to the elements;

"Weathertight" means capable of preventing the admission of a significant quantity of water into the vessel when subjected to a hose test;

"Workboat" in this Code means a small vessel in commercial use for purposes other than sport or pleasure other than a dedicated pilot boat.

3 APPLICATION AND INTERPRETATION

3.1 Application

3.1.1 Compliance with the Code satisfies the requirements of the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998. The Regulations permit the Code to be applied to any United Kingdom commercially operated vessel of up to 24 metres load line length (and any such vessel registered or owned in another country when it operates from a United Kingdom port) which proceeds to sea, carrying cargo and/or not more than 12 passengers or providing a service in which neither cargo nor passengers are carried.

3.1.2 The Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998, under which the Code is applied, states that "any provision of the Code expressed in the conditional (i.e. "should") shall be a requirement".

3.1.3 The Code should apply on the date of coming into force of the enabling Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998 to:-

pilot boats; and
small vessels which carry cargo; and
subject to the provisions given below (in this sub-section), small vessels which do not carry cargo and which are in commercial use for purposes other than sport or pleasure and are subject to the Merchant Shipping (Load Line) Regulations 1998.

The Code should apply on the date of coming into force of the enabling legislation to the class of small seagoing workboats which was previously exempt from load line regulations and certification (see 1.3). (The vessels were not exempt from other Merchant Shipping regulations.)

The workboats were previously exempt from load line regulations as vessels of under 80 tons register (net tons) which were engaged solely in the United Kingdom coasting trade while not carrying cargo and "carrying not more than 12 passengers on a voyage in the course of which they are at no time more than 3 miles from land nor more than 15 miles from their point of departure, unless the point of departure lies within category A, B, C or D waters when the distance of 15 miles shall be measured from the seaward boundary of such limits". The exemption has been removed.

(Other previously exempted commercial vessels which are not small vessels but which are now required to be certificated, should be certificated in compliance with the Merchant Shipping

(Load Line) Regulations 1998 and other regulations appropriate to the use of the vessel.)

3.1.4 The Code applies to monohull and multihull vessels.

3.1.5 It is the responsibility of the owner/managing agent to ensure that a vessel is properly maintained and examined in accordance with the Code.

3.2 Areas of Operation

3.2.1 A vessel other than a dedicated pilot boat may be considered for the issue of a Workboat Certificate allowing it to operate at sea within one of the following areas:-

Category 6 - within 3 miles of land and not more than 3 miles radius from either the point of departure to sea or the seaward boundary of protected waters (see definition of "protected waters");

Category 5 - up to 20 miles from a nominated departure point, in favourable weather and in daylight;

Category 4 - up to 20 miles from a safe haven, in favourable weather and in daylight;

Category 3 - up to 20 miles from a safe haven;

Category 2 - up to 60 miles from a safe haven;

Category 1 - up to 150 miles from a safe haven.

3.2.2 A pilot boat should have a valid Pilot Boat Certificate (or Pilot Boat endorsement of a valid Workboat Certificate) allowing it to operate in the area(s) in which it provides a pilotage service, including areas which are not to sea.

3.3 Certification

To be issued with a certificate for a particular area and type of operation, a vessel should comply with all the corresponding requirements of the Code to the satisfaction of the Certifying Authority.

3.4 Sport Diving, Sea Angling and Other Water Based Recreation Activities

The relevant Code of Practice and certification for the safety of small vessels in commercial use for sport or pleasure is one which is accepted by the Merchant Shipping (Vessels in Commercial Use for Sport or Pleasure) Regulations 1998 (see 1.4).

3.5 Interpretation

Where there is a question of application of the Code, or of interpretation of a part of the Code the owner /managing agent of the vessel concerned should in the first instance seek clarification from the Certifying Authority. In situations where it is not possible to resolve an issue of interpretation a decision may be obtained on written application to the Director of Standards Division in the Maritime and Coastguard Agency, who may consult with others as deemed appropriate.

3.6 Updating of the Code

3.6.1 In addition to the arrangements for interpretation in 3.5 the requirements of the Code will be reconsidered by a standing committee, comprising representatives from the organisations named in 1.6, not later than 4 years from the date of coming into force of the Code's enabling legislation to take account of experience gained from its application.

3.6.2 Thereafter, the Code will be reviewed by the standing committee at intervals not exceeding five years to take into account experience and any new statutory requirements which apply to other vessels of a similar size or type and which it might be considered reasonable to apply to vessels operating under the Code.

3.6.3 When new standards are developed and finalised by the British Standards Institution (BS), European Committee for Standardization (CEN), International Maritime Organization (IMO), International Organization for Standardization (ISO) or any other international body, which impact upon the requirements of the Code, amendment of the Code may be considered immediately.

3.6.4 The Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998 provide for any document amending the Code which is considered relevant from time to time to be specified by the Secretary of State in a Merchant Shipping Notice.

3.7 Vessels Operating in Protected Waters and/or a Restricted Service - Equivalent Safety Standards

When the owner/managing agent of a vessel which operates on the coast of the United Kingdom in protected waters and/or a restricted service considers that full application of the Code would be inappropriate because other safety provisions

have been made, the owner/managing agent may request the Regional Chief Surveyor of the Maritime and Coastguard Agency (for the service area) to consider certification of the vessel in compliance with alternative safety standards.

Guidance to the Regional Chief Surveyor on alternative safety standards is given in Annex 2 and, 27.3.1.4 refers to agreed procedures leading to the issue of a workboat certificate.

3.8 Equivalent Standards

- 3.8.1 When the Code requires that a particular piece of equipment or machinery should be provided or carried in a vessel or that any particular provision should be made, the Maritime and Coastguard Agency may permit any other piece of equipment or machinery to be provided or carried, or any other provision to be made, provided the Maritime and Coastguard Agency is satisfied by trials or otherwise that the alternative is at least as effective as that required by the Code.
- 3.8.2 For the purpose of the Code, the results of verification and tests carried out by bodies and laboratories of other Member States of the European Economic Area Agreement offering suitable and satisfactory guarantees of technical and professional competence and independence should be accepted.

4 CONSTRUCTION AND STRUCTURAL STRENGTH

4.1 General Requirements

- 4.1.1 A vessel for which the area of operation is more than 20 miles from a safe haven should normally be fitted with a watertight weather deck over the length of the vessel (also see 4.3.1.1) and be of adequate structural strength to withstand the sea and weather conditions likely to be encountered in the area of operation.
- 4.1.2 A vessel which is not fitted with a watertight weather deck in accordance with 4.1.1 should normally be restricted to service in area category 3, 4, 5 or 6 (and in favourable weather). An open boat (see Section 2 for definition) should be provided with adequate reserves of buoyancy and stability for the vessel loaded with cargo and/or its full complement of persons to survive the consequences of swamping (see Section 11).
- 4.1.3 A vessel which is an open boat not fitted with a watertight weather deck should normally be restricted to service in area category 4, 5 or 6 (and in favourable weather).
- 4.1.4 In any event, an open boat should not carry cargo, or a combination of passengers and cargo, weighing in excess of 1000kg. (One passenger is assumed to weigh 75kg).
- 4.1.5 A vessel which is to operate in sea ice conditions should be specially considered.
- 4.1.6 A vessel which is constructed to a standard which imposes limiting conditions on its operational service should be specially considered.

4.2 Structural Strength

4.2.1 General

The design of hull structure and its construction should provide strength and service life for the safe and effective operation of a vessel, to withstand the sea and weather conditions encountered in the area of operation.

4.2.2 Construction materials

- 4.2.2.1 A vessel may be constructed of wood, fibre reinforced plastic (FRP), aluminium alloy or steel or combinations of such materials.
- 4.2.2.2 Proposals to use any other construction material should be submitted to the Certifying Authority for consideration and approval. When a Certifying Authority

considers it does not have the necessary expertise to deal with vessels of the hull material proposed, the Maritime and Coastguard Agency should be consulted with regard to the procedures to be adopted.

4.2.2.3 Requirements for materials used for the construction of inflatable and rigid inflatable boats are given in 4.5.2.

4.2.3 New vessels

4.2.3.1 Subject to 4.2.1, the hull of a new vessel which has been surveyed and certificated by a United Kingdom Load Line Assigning Authority should be acceptable, subject to presentation of a certificate of construction and satisfactory verification by the Certifying Authority.

4.2.3.2 United Kingdom Load Line Assigning Authorities are Lloyd's Register of Shipping, the British Technical Committee of American Bureau of Shipping and the British Committees of Bureau Veritas, Det Norske Veritas, Germanischer Lloyd and Registro Italiano Navale.

4.2.3.3 The hull of a new vessel which has not been built under the survey of a United Kingdom Load Line Assigning Authority will be considered to be of adequate strength after a satisfactory examination by an authorised person and if it has been built :-

- .1 in accordance with the current hull construction rules for the small vessel type published by one of the Assigning Authorities; or
- .2 in general accord with the standard of a vessel of similar configuration and manner of use and which has a record of at least five years' history of safe operation in an area where the sea and weather conditions are no less severe than those likely to be encountered in the area of operation.

4.2.3.4 The hull of a new vessel not built in accordance with either 4.2.3.1 or 4.2.3.3 may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is submitted to and accepted by the Certifying Authority.

4.2.4 Existing vessels

An existing vessel will be considered to be of acceptable strength if it is in a good state of repair and is :-

4.2.4.1 built to one of the standards described in 4.2.3, for new vessels; or

4.2.4.2 of a design with a record of at least five years' history of safe operation in an area where the sea and weather conditions and manner of use are no less severe than those likely to be encountered in the area of operation; or

4.2.4.3 in possession of a valid load line certificate or load line exemption certificate appropriate to the area of operation.

4.3 Decks

4.3.1 Weather deck

4.3.1.1 A watertight weather deck referred to in 4.1.1 should extend from stem to stern and have positive freeboard throughout, in any condition of loading of the vessel.

4.3.1.2 A weather deck may be stepped, recessed or raised provided the stepped, recessed or raised portion is of watertight construction.

4.3.1.3 Minimum requirements for freeboard are given in Section 12.

12.2.1.2 In particular, attention is drawn to:-

for determining freeboard of a vessel which carries cargo or a combination of passengers and cargo weighing not more than 1000kg and in which the continuous watertight weather deck is stepped, recessed or raised; and

a decked vessel deficient in freeboard being treated as an open boat - definition in Section 2.

4.3.2 Recesses

(For water freeing arrangements generally, see Section 6 and for freeboard requirements, see Section 12.)

4.3.2.1 A recess in the weather deck should be of weathertight construction and have means of drainage capable of efficient operation when the vessel is heeled to 10°, such drainage to have an effective area, excluding grills and baffles, of at least 20cm² for each cubic metre of volume of recess below the weather deck.

4.3.2.2 Alternative arrangements for drainage of a recess may be accepted provided it can be demonstrated that, with the vessel upright and at its deepest draught, the recess drains from a swamped condition within 3 minutes.

4.4 Watertight Bulkheads (see 11.1.4 and 11.2.4)

4.4.1 A new vessel of 15 metres in length and over or which is certificated to carry 15 or more persons or which is certificated to operate in area category 1 should be

provided with watertight bulkheads which are arranged such that the vessel will meet the damage stability requirements of 11.1.4.

- 4.4.1.1 The strength of a watertight bulkhead should be adequate to withstand the flooding damage condition, to the satisfaction of the Certifying Authority.
- 4.4.1.2 When pipes, cables, etc. penetrate watertight bulkheads, they should be provided with valves and/or watertight glands as appropriate.
- 4.4.1.3 A door fitted in a watertight bulkhead should be of watertight construction and be kept closed at sea, unless opened at the discretion of the skipper.
- 4.4.1.4 When a door fitted in a watertight bulkhead is required to be kept open when the vessel is at sea, the door should be of a power operated sliding watertight construction and be a type approved by the Maritime and Coastguard Agency. The door should have controls local to the door and from a location(s) above the bulkhead deck (at which location(s) open/closed indication should be provided). At the door, warning indication of door closure should be provided.
- 4.4.2 It is most strongly recommended (see 11.2.4) that modifications which cause the vessel to meet the standards given in 4.4.1 and 11.1.4 be implemented when an existing vessel of 15 metres in length and over or which is certificated to carry 15 or more persons or which is certificated to operate in area category 1 undergoes major structural alterations.
- 4.4.3 For any other vessel the provision of watertight bulkheads is not mandatory but when such a bulkhead is fitted for the safety of the vessel it should satisfy at least the requirements of 4.4.1.1, 4.4.1.2 and 4.4.1.3.

4.5 Inflatable Boats

The following requirements should apply to an inflatable or rigid inflatable boat which is proposed for operation under the Code, other than a tender (dinghy) covered by Section 24:-

4.5.1 General

- 4.5.1.1 Generally, an inflatable boat or rigid inflatable boat which is to operate as an independent vessel under the Code (and is not a tender operating from a vessel) should be of a design and construction which would meet the requirements of Chapter III of the 1974 Safety of Life at Sea (SOLAS) Convention and the parts of the Annex to the International Maritime Organization (IMO) Resolution A.689(17) - Testing of Life-Saving Appliances - which are appropriate to the type of boat, and subject to the variations which are given in the Code.

- 4.5.1.2 When production of boats is covered by a quality system recognised by the Certifying Authority and boats are built in batches to a standard design, prototype tests on one boat may be accepted for a boat of the same design submitted for compliance with the Code.
- 4.5.1.3 A boat should be of strength to withstand the sea and weather conditions likely to be encountered in the area of operation.
- 4.5.1.4 An approved boat may be accepted for area categories 4, 5 or 6, in favourable weather.
- 4.5.1.5 A rigid inflatable boat with a substantial enclosure for the protection of persons on board and purpose designed may be considered for operations in area categories 2 or 3 subject to approval by a Certifying Authority.

4.5.2 Construction materials

Materials should satisfy the requirements of Chapter III of the 1974 SOLAS Convention, except that fire-retarding characteristics are not required for the hull material.

4.5.3 New inflatable boats

- 4.5.3.1 A new inflatable boat or rigid inflatable boat should satisfy the requirements of Chapter III of the 1974 SOLAS Convention and be tested in accordance with the requirements of IMO Resolution A.689(17) as appropriate to the intended use of the boat.

As a minimum, tests to verify strength of structure should include drop and towing. When lifting arrangements are provided in a boat, a lifting (overload) test should be carried out at ambient temperature with the boat loaded with the mass of the full complement of persons and equipment for which it is to be approved. After each test, the boat should not show any signs of damage or strain.

- 4.5.3.2 A new boat of a type certified as a rescue boat under Merchant Shipping Regulations or provided with a letter of compliance for use as a fast rescue boat for offshore stand-by vessels, or any equivalent certification or compliance, should be accepted as complying with the construction requirements of the Code.
- 4.5.3.3 A new boat which is not built in accordance with either 4.5.3.1 or 4.5.3.2 may be specially considered, provided that full information (including calculations, drawings, details of materials and construction) is presented to and approved by the Certifying Authority and tests should be conducted to verify strength of structure (see 4.5.3.1).

4.5.3.4 A permanent shelter provided for the protection of persons on board should be of construction adequate for the purpose and the area of operation.

4.5.4 Existing inflatable boats

An existing inflatable boat or rigid inflatable boat will be considered to be of acceptable structural strength if it is in a good state of repair and is :-

4.5.4.1 built to one of the standards described in 4.5.3, for a new boat; or

4.5.4.2 of a design with a record of at least five years' history of safe operation in an area where the sea and weather conditions are no less severe than those likely to be encountered in the area of operation.

5 WEATHERTIGHT INTEGRITY

A decked vessel should be designed and constructed in a manner which will prevent the ingress of sea water and in particular comply with the following requirements:-

5.1 Hatchways and Hatches and other Openings

5.1.1 General requirements

- 5.1.1.1 A hatchway which gives access to spaces below the weather deck should be of efficient construction and be provided with efficient means of weathertight closure. (See 25.3.3 for cargo hatchways.)
- 5.1.1.2 A cover to a hatchway should be hinged, sliding, or permanently secured by other equivalent means to the structure of the vessel and be provided with sufficient locking devices to enable it to be positively secured in the closed position.
- 5.1.1.3 A hatchway with a hinged cover which is located in the forward portion of the vessel should normally have the hinges fitted to the forward side of the hatch, as protection of the opening from boarding seas.
- 5.1.1.4 Hatches which are used for escape purposes should be capable of being opened from both sides.
- 5.1.1.5 Hatches which are to be kept closed for safety reasons when the vessel is at sea should have prominent "keep closed" warning notices attached to the vessel structure on both sides.

5.1.2 Hatches which are open at sea

Whereas safety considerations require that hatches should be kept closed when a vessel is at sea, operational needs may exist for specified hatches to be open at sea for lengthy periods. Hatches which need to be open at sea should be:-

- .1 kept as small as practicable, but never more than 1m² in plane area at the top of the coaming.
- .2 located on the centre line of the vessel or as close thereto as practicable and compatible with the proper working of the vessel.
- .3 fitted such that the access opening is at least 300mm above the top of the adjacent weather deck at the side of the vessel.

5.2 Doorways and Companionways

5.2.1 Doorways located above the weather deck

5.2.1.1 A doorway located above the weather deck which gives access to spaces below should be provided with a weathertight door. The door should be of efficient construction, permanently attached to the bulkhead, not open inwards, and sized such that the door overlaps the clear opening on all sides, and has efficient means of closure which can be operated from both sides.

5.2.1.2 A doorway should be located as close as practicable to the centre line of the vessel. However, if hinged and located in the side of a house, the door should be hinged on the forward edge.

5.2.1.3 A doorway which is either forward or side facing should be provided with a coaming the top of which is at least 300mm above the weather deck. A coaming may be portable provided it is permanently secured to the structure of the vessel and can be locked in position.

5.2.2 Companion hatch openings

5.2.2.1 A companion hatch opening from a cockpit or recess which gives access to spaces below the weather deck should be fitted with a coaming, the top of which is at least 300mm above the sole of the cockpit or recess.

5.2.2.2 When washboards are used to close a vertical opening they should be so arranged and fitted that they will not become accidentally dislodged in any event.

5.2.2.3 The breadth of the opening of a companion hatch should not exceed 1 metre.

5.3 Skylights

5.3.1 A skylight should be of efficient weathertight construction and should be located on the centre line of the vessel, or as near thereto as practicable, unless it is offset by necessity to provide a means of escape from a compartment below deck.

5.3.2 When a skylight is an opening type it should be provided with efficient means whereby it can be secured in the closed position from both sides.

5.3.3 In a new vessel, a skylight which is provided as a means of escape should be capable of being opened from both sides.

5.3.4 Unless the glazing material and its method of fixing in the frame is equivalent in strength to that required for the structure in which it is fitted, a portable "blank"

should be provided which can be efficiently secured in place in event of breakage of the glazing. The blank should be of suitable material and strength to the satisfaction of the certifying authority.

5.4 Portlights and Windows

- 5.4.1 A portlight or window to a space below the weather deck or in a step, recess, raised deck structure, deckhouse or superstructure protecting openings leading below the weather deck should be of efficient construction which provides weathertight integrity (and be of strength compatible with size) for the intended area of operation of the vessel.
- 5.4.2 In a new vessel, a portlight or window should not be fitted in the main hull below the weather deck, unless the glazing material and its method of fixing in the frame are equivalent in strength to that required for the structure in which it is fitted.
- 5.4.3 In a new vessel, an opening portlight should not be provided to a space situated below the weather deck.
- 5.4.4 In a new vessel, portlights, windows and their frames should meet the requirements of ISO 12216 - Windows, portlights, hatches, deadlights and doors - Strength and tightness requirements, or equivalent standard.
- 5.4.5 In an existing vessel, a portlight fitted below the weather deck and not provided with an attached deadlight should be provided with a "blank" (the number of blanks should be sufficient for at least half of the number of such portlights of each different size in the vessel), which can be efficiently secured in place in the event of breakage of the portlight. The blank should be of suitable material and strength to the satisfaction of the Certifying Authority.
- Such a "blank" is not required for a non-opening portlight which satisfies 5.4.2.
- 5.4.6 An opening portlight should not exceed 250mm in diameter or equivalent area.
- 5.4.7 In an existing vessel, a window fitted in the main hull below the weather deck should meet the requirements of 5.4.2 or be provided with a blank meeting the requirements of 5.4.8.
- 5.4.8 In a vessel which operates 60 miles or more from a safe haven (area category 1), portable "blanks" for windows should be provided (the number of blanks should be sufficient for at least half of the number of such windows of each different size in the vessel) which can be efficiently secured in place in the event of breakage of a window.

Such a "blank" is not required for a window which satisfies 5.4.2.

5.4.9 For the wheelhouse:-

- .1 windows and their frames should meet the requirements of ISO 12216 (see 5.4.4) or equivalent standard, having due regard to the increased thickness of windows comprising one or more laminations in order to achieve equivalent strength (see Merchant Shipping Notice No. M.712 - Shattering of windows in heavy weather); and
- .2 polarised or tinted glass should not be used in windows provided for navigational visibility (although portable tinted screens may be provided for nominated windows); and
- .3 when a vessel is expected to operate in severe weather (relative to the size of the vessel), efficient storm shutters should be provided for all front and side facing windows.

5.5 Ventilators and Exhausts

- 5.5.1 A ventilator should be of efficient construction and be provided with a permanently attached means of weathertight closure.
- 5.5.2 A ventilator should be kept as far inboard as practicable and the height above the deck of the ventilator opening should be sufficient to prevent the admission of water when the vessel is heeled. (See 11.1.2.5, 11.1.2.6 and 11.4.2.3.2.)
- 5.5.3 A ventilator which must be kept open, e.g. for the supply of air to machinery or for the discharge of noxious or flammable gases, should be specially considered with respect to its location and height above deck having regard to 5.5.2 and the downflooding angle. (See 11.1.2.5, 11.1.2.6 and 11.4.2.3.2.)
- 5.5.4 An engine exhaust outlet which penetrates the hull below the weather deck should be provided with means to prevent backflooding into the hull through the exhaust system. The means may be provided by system design and/or arrangement, built-in valve or a portable fitting which can be applied readily in an emergency.

5.6 Air Pipes

- 5.6.1 When located on the weather deck, an air pipe should be kept as far inboard as possible and/or have a height above deck sufficient to prevent downflooding. (See 11.1.2.5, 11.1.2.6 and 11.4.2.3.2.)

- 5.6.2 An air pipe, of greater than 10mm inside diameter, serving a fuel tank (also see 7.1.3) or other tank should be provided with a closing appliance of a type which will prevent excessive pressure on the tank boundaries. Provision should be made for relieving a vacuum when tanks are being drawn from or emptied.

5.7 Sea Inlets and Discharges

- 5.7.1 An opening below the weather deck should be provided with an efficient means of closure.
- 5.7.2 When an opening is for the purpose of an inlet or discharge below the waterline it should be fitted with a seacock, valve or other effective means of closure which is readily accessible in an emergency.
- 5.7.3 When an opening is for a log or other sensor which is capable of being withdrawn it should be fitted in an efficient watertight manner and provided with an effective means of closure when such a fitting is removed.
- 5.7.4 Inlet and discharge pipes from water closets should be provided with shell fittings as required by 5.7.2. When the rim of a toilet is either below or less than 300mm above the deepest waterline of the vessel, anti-syphon measures should be provided.

5.8 Materials for Valves and Associated Piping

- 5.8.1 A valve or similar fitting attached to the side of the vessel below the waterline, should be normally of steel, bronze or other non-brittle fire resistant material or equivalent.
- 5.8.2 When unprotected plastic piping is used it should be of good quality and of a type suitable for the purpose. If fitted within an engine space or fire risk area, a means should be provided to stop the ingress of water in the event of the pipe being damaged, operable from outside the space.

6 WATER FREEING ARRANGEMENTS

- 6.1 When a deck is fitted with bulwarks such that shipped water may be trapped, the bulwarks should be provided with efficient freeing ports.
- 6.2 The area of freeing ports should be at least 4% of the bulwark area and be situated in the lower third of the bulwark height, as close to the deck as practicable.
- 6.3 A vessel of less than 12 metres in length, having a well deck aft which meets the freeboard requirements of Section 12 and is fitted with bulwarks all round and which always operates with stern trim, in favourable weather and no more than 60 miles from a safe haven (area category 2, 3, 4, 5 or 6), should be provided with freeing ports required by 6.2 or may be provided with a minimum of two ports fitted (one port and one starboard) in the transom, each having a clear area of at least 225 sq.cm.
- 6.4 When a non-return shutter or flap is fitted to a freeing port it should have sufficient clearance to prevent jamming and any hinges should have pins or bearings of non-corrodible material. Normally, hinges should be along the upper edge of the non-return shutter or flap.
- 6.5 When a vessel has only small side deck areas in which water can be trapped a smaller freeing port area may be accepted. The reduced area should be based on the volume of water which is likely to become trapped.
- 6.6 In a vessel in which freeing ports cannot be fitted, other efficient means of clearing trapped water from the vessel should be provided to the satisfaction of the Certifying Authority.
- 6.7 Structures and spaces considered to be non-weathertight should be provided with efficient drainage arrangements.
- 6.8 Where cargo is to be stowed on deck the stowage arrangement should be such as to not impede the free flow of water from the deck.

6.9

A vessel intended to operate in sea areas where ice accretion can occur should be specially considered with regard to water freeing arrangements. (Also see 11.1.1.5.)

7 MACHINERY

7.1 General Requirements

7.1.1 Generally, machinery installations should comply with the requirements given below. Other installations proposed may be specially considered, provided that full information is presented to and approved by the Certifying Authority.

7.1.2 In all vessels, the main propulsion machinery and all auxiliary machinery essential to the propulsion and the safety of the vessel should be designed to operate when the vessel is upright and when inclined at any angle of heel and trim up to and including 15° and 7.5° respectively either way under static conditions.

7.1.3 Fuel filling and venting pipes should be constructed of fuel compatible non-kinking material, adequately supported and of sufficient dimensions to prevent spillage during filling.

A venting pipe should be led to the open atmosphere, terminating in a position level with or higher than the fuel filling mouth and its open end protected against:-

- .1 water ingress - by a goose neck or other efficient means; and
- .2 flame ingress - by a suitable gauze diaphragm (which can be detached for cleaning).

7.2 Diesel Engines

A vessel fitted with either an inboard or an outboard diesel engine should be provided with an efficient marinised engine and sufficient fuel tankage for its area of operation.

7.3 Petrol Engines

7.3.1 New vessels

7.3.1.1 In the particular case of a proposal to install an inboard petrol engine in a new vessel, full information should be presented to the Maritime and Coastguard Agency for approval.

7.3.1.2 Subject to 7.3.1.4, in a vessel which is fitted with a watertight weather deck, a petrol engine may be accepted provided that the engine is a suitable outboard type and:-

- .1 a fixed-in-place fuel tank complying with both 7.3.1.3.1 and 7.3.1.3.2 is fitted below the deck and spillage during fuel handling will drain directly overboard; or
- .2 a fixed-in place fuel tank complying with only 7.3.1.3.1 is fitted above the deck and spillage during fuel handling will drain directly overboard; or
- .3 fuel is supplied to the engine from a portable tank of 27 litres or less in capacity complying with the requirements of ISO 13591 - Portable fuel systems for outboard motors, or its equivalent National Standard.

7.3.1.3 Subject to 7.3.1.4, in a vessel which is an open boat, a marinised petrol engine may be accepted provided that the engine is a suitable outboard type. Fuel tanks should comply with 7.3.1.2.3. However, in a rigid hull vessel or rigid inflatable boat a safely located fixed-in-place inboard tank may be accepted subject to:-

- .1 the tank being constructed of mild steel (hot dipped galvanised after fabrication), or stainless steel, with rounded corners and edges for explosion proofing purposes, and installation complying with 7.4;

Note: (a) Foils, intended to prevent explosions, should not be used in a steel tank; and

(b) The tank should be tested to at least 0.3 bar.

- .2 an intrinsically safe or flameproof detector and alarm (or any other standard of safety accepted by the Maritime and Coastguard Agency) of hydrocarbon gas being fitted under or adjacent to the tank where hydrocarbon gas is likely to accumulate; and
- .3 electrical arrangements complying with Section 8.

7.3.1.4 A small marinised petrol engine (usually less than 5 horse power) manufactured with an integral fuel tank can be accepted for either outboard propulsion or portable plant provided a safety warning sign is displayed with details of appropriate precautions to be taken when filling the fuel tank. (The installation requirements of 7.4 do not apply.)

7.3.2 Existing vessels

7.3.2.1 In an existing vessel only, an inboard petrol engine may be accepted provided that the engine is located in an effective enclosed space to which a fixed fire extinguishing system is fitted and:-

- .1 provision is made to ventilate the engine space thoroughly without risk of ignition before the engine is started; and
- .2 a fixed-in-place inboard petrol tank complies with 7.3.1.3.2, 7.3.1.3.3 and 7.1.3; or
- .3 a portable petrol tank complies with 7.3.1.2.3.

7.3.2.2 In an existing vessel outboard petrol engines may be accepted, provided fuel requirements comply with 7.3.1.2.3. or 7.3.1.4.

7.3.2.3 In an existing inflatable boat or rigid inflatable boat, a petrol engine installation should meet the requirements of 7.3.1.3 or 7.3.1.4.

7.4 Installation

7.4.1 The machinery, fuel tank(s) and associated piping systems and fittings should be of a design and construction adequate for the service in which they are used and should be so installed and protected as to reduce to a minimum danger to persons during normal movement about the vessel, due regard being paid to moving parts, hot surfaces and other hazards.

7.4.2 Petrol tanks (except those integral with small engines - see 7.3.1.4) for new and existing vessels should have all connections and fittings at the top of the tank. (See ISO 10088:1992 - Permanently installed fuel systems and fixed fuel tanks.)

7.4.3 Means should be provided to isolate a source of fuel which may feed a fire in an engine space fire situation. A valve or cock, which is capable of being closed from a position outside the engine space, should be fitted in the fuel feed pipe as close as possible to the fuel tank.

7.4.4 In a fuel supply system to an engine unit, when a flexible section of piping is introduced, connections should be of a screw type or equivalent approved type. Flexible pipes should be fire resistant/metal reinforced or otherwise protected from fire. Materials and fittings should be of a suitable recognised national or international standard.

Relevant standards applicable to flexible fuel hoses in small craft are:

BS EN ISO 8469:1995 Small craft - Non-fire-resistant fuel hoses; and
BS EN ISO 7840:1995 Small craft - Fire-resistant fuel hoses.

7.4.5 In the case of an existing vessel fitted with a diesel engine in which the flexible section of piping installed does not meet the requirements of 7.4.4, the

requirements should be met when existing fittings in the fuel supply system are replaced.

- 7.4.6 When the main engine(s) oil fuel system is provided with water separator filter(s) of a type which has plastic or heat and shock resistant glass bowl(s), thermal shut-off valve(s) should be fitted to the inlet side of the filter(s). The setting of the thermal shut-off valve(s) should be appropriate to the failure temperature of the bowl material.
- 7.4.7 Saveall(s) or equivalent means of containment of spillage should be provided below fuel pump(s) and filter(s).

7.5 Engine Starting

- 7.5.1 An engine should be provided with either mechanical or hand starting or electric starting with independent batteries or other means of starting acceptable to the Certifying Authority.
- 7.5.2 When the sole means of starting is by battery, the battery should be in duplicate and connected to the starter motor via a 'change over switch' so that either battery can be used for starting the engine. In normal circumstances it should not be possible to run both batteries in parallel. (For cold starting of the engine the use of both batteries in parallel can be accepted.) Charging facilities should be available for the batteries when the engine is running.

7.6 Portable Plant

- 7.6.1 When portable plant powered by a petrol engine is provided, the unit should be stored on the weather deck.
- 7.6.2 A deck locker or protective enclosure for the portable plant should have no opening(s) to an enclosed space within the hull of the vessel and the locker or protective enclosure should be adequately ventilated and drained.
- 7.6.3 Petrol tanks provided for the engine should comply with the appropriate requirements of 7.3.1.2.3 and 7.3.1.4.
- 7.6.4 Gas welding and cutting equipment, if carried, should be stowed in a secure manner on the open deck at a safe distance away from any potential source of fire and should have the capability of being readily jettisoned overboard if necessary.

7.7 Stowage of Petrol

When spare petrol is carried on board in portable containers for any purpose, the containers should be clearly marked and should be stowed on the weather deck where they can readily be jettisoned and where spillage will drain directly overboard. The quantity of petrol and number of containers should be kept to a minimum.

8 ELECTRICAL ARRANGEMENTS

8.1 General

8.1.1 The electrical arrangements should be such as to minimise the risk of fire and electric shock.

Tanks, machinery or other metallic objects which do not have good electrical continuity with the water surrounding the vessel should have special earthing arrangements to reduce such risks.

8.1.2 The electrical systems described in 8.2 to 8.6 are the most common types suitable for small vessels i.e. 12V to 24V direct current systems.

However, a workboat may have alternating current electrical equipment of much higher multiphase voltage, in which case compliance with reference 8.7.1 or 8.7.7 would be necessary.

For general guidance, a number of the most common standards which are appropriate to a small vessel are listed in 8.7. (Other standards which are considered more appropriate and safe for a particular application may be used, provided they are acceptable to the Certifying Authority.)

8.1.3 In an existing vessel, the electrical arrangements should meet the general principles for safety, be in good condition and have a recorded history of safe operation, to the satisfaction of the Certifying Authority.

8.2 Systems

8.2.1 Systems should be two wire, except that single wire systems are acceptable for engine circuits comprising engine mounted equipment and which have a return connection made at the engine itself.

8.2.2 A system in which there is no intentional connection of the circuit to earth (an insulated system) should be provided with double pole switches, except that single pole switches may be used in the final sub-circuit.

8.2.3 Single pole switches are acceptable in a system with one pole earthed. Fuses should not be installed in an earthed conductor.

8.2.4 The insulation resistance, using a low voltage instrument so as not to cause damage, should not be less than 0.3 megohm for all new vessels, but a minimum of 0.1 megohm can be accepted on existing vessels.

- 8.2.5 All circuits, except the main supply from the battery to the starter motor and electrically driven steering motors, should be provided with electrical protection against overload and short circuit, (i.e. fuses or circuit breakers should be installed). Short circuit protection should be for not less than twice the total rated current of the motors in the circuit protected.

Steering motors should have an overload alarm in lieu of overload protection.

8.3 Batteries

- 8.3.1 Traditional alkaline and lead acid batteries evolve flammable hydrogen gas which can escape to a high level within the space through the vent plugs provided. Consequently, potential sources of ignition such as electrical equipment not directly associated with the battery installation, loose metallic objects, spanners etc. should be kept clear.

Alkaline and lead acid batteries of the so called "sealed" or "maintenance free" type may also evolve small quantities of flammable gas and so the space in which they are located should always be provided with some measure of ventilation.

The evolution of gas from batteries (all types) is related to the design and efficient working of the charging system. Means should be provided to prevent overcharging.

(Note: It should be appreciated that flammable gases can be produced by both alkaline and lead acid batteries of the so called "sealed" or "maintenance free" type. The majority of the hydrogen and oxygen produced within the cells is re-combined to form water but the process is not 100% efficient. Consequently these batteries are fitted with valves to relieve internal pressure and can evolve small quantities of flammable gas. Future British and International Standards will refer to this type of battery as "valve regulated sealed" type.

Guidance on the battery installation and ventilation is contained in the Institution of Electrical Engineers Regulations, see 8.7.1.)

- 8.3.2 A battery cut-out switch should be provided for all systems. It is preferred that this switch acts as an isolator i.e. it is double pole. If a battery change-over switch is fitted and is provided with an "off" position, this may serve as the cut-out switch also.
- 8.3.3 Batteries should be secured firmly to avoid movement when the vessel is subjected to sudden acceleration or deceleration, a large angle of heel, trim etc.

8.3.4 Batteries and battery systems should be provided as indicated in 7.5.1, 7.5.2 and 16.2.6.

8.4 Cables

8.4.1 Electric cables should be constructed to a recognised standard for marine use in small vessels.

8.4.2 Cables which are not provided with electrical protection should be kept as short as possible and should be "short circuit proofed" e.g. single core with additional insulated sleeve over the insulation of each core. Normal marine cable which is single core will meet this requirement without an additional sleeve, since it has both conductor insulation and a sheath.

8.4.3 All wiring should be carried out with flame retardant cable. Note that when selecting cables, particular attention should be given to environmental factors such as temperature and contact with damaging substances e.g. polystyrene, which degrades PVC insulation.

8.4.4 Adequate provision should be made for securing electrical connections e.g. by use of locking washers.

8.5 Lighting

8.5.1 A single hazardous event should not be capable of disabling all lighting systems.

8.5.2 Lighting circuits should be distributed through the spaces so that a total blackout cannot occur due to the failure of a single protective device.

8.5.3 Where general lighting is provided by a single centralised source, an alternative source of lighting should also be provided sufficient to enable persons to make their way to the open deck or to permit work on essential machinery.

8.5.4 Emergency lighting should be provided to illuminate the survival craft launching and embarkation areas and manoverboard rescue equipment and rescue areas.

8.6 Hazardous Spaces

8.6.1 Where practicable, electrical equipment should not be installed in a space where petroleum vapour or other hydrocarbon gas may accumulate. When equipment is installed in such a space it must comply with a recognised standard for prevention of ignition of the flammable atmosphere.

- 8.6.2 Any compartment which contains a gas consuming appliance or any compartment into which flammable gas may leak or accumulate, should be provided with a hydrocarbon gas detector and alarm. The detector and alarm should be designed to comply with a recognised standard in accordance with 8.6.1.

8.7 Reference Standards

- 8.7.1 The Institution of Electrical Engineers Regulations for the Electrical and Electronic Equipment of Ships with Recommended Practice for their Implementation, 6th Edition 1990 and subsequent supplements.
- 8.7.2 British Marine Industries Federation Code of Practice for Electrical and Electronic Installations in Boats, 3rd Edition.
- 8.7.3 BS 6883, Specification for elastomer insulated cables for fixed wiring in ships. (Suitable for lighting, power, control, instrumentation and propulsion circuits.)
- 8.7.4 IEC 92-350, Low-voltage shipboard power cables. (General construction and test requirements for shipboard cables with copper conductors intended for low-voltage power systems at voltages up to and including 0.6/1kV.)
- 8.7.5 BS 5345, Code of practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture).
- 8.7.6 ISO 10133, Small Craft - Electrical systems - Extra-low voltage d.c. installations.
- 8.7.7 ISO 13297, Small Craft - Electrical systems - Alternating current installations.
- 8.7.8 BS EN 28846, Small Craft - Electrical devices - Protection against ignition of surrounding flammable gases.
- 8.7.9 BS EN 50057, Electrical apparatus for the detection and measurement of combustible gases.

9 STEERING GEAR, RUDDER AND PROPELLER SYSTEMS

9.1 Steering Gear

- 9.1.1 A vessel should be provided with efficient means of steering.
- 9.1.2 The control position should be located so that the person conning the vessel has a clear view for the safe navigation of the vessel.
- 9.1.3 Where steering is effected by remote control, an arrangement should be in place for emergency steering in the event of failure of the remote control. This may take the form of a tiller to fit the head of a rudder stock, or a rod attachment which may be fitted to a Z-drive framework. Some twin screw vessels may be able to demonstrate adequate emergency steerage under reduced power without any special arrangement.
- 9.1.4 If emergency steering is totally impractical, alternative safety measures and/or procedures to deal with any steering failure situation should be agreed with the Certifying Authority. (The Certifying Authority may consider the application of restrictions to the service area of the vessel.)
- 9.1.5 Steering systems should comply with the appropriate BS EN ISO Standard for Small Craft steering systems.

9.2 Rudder System

- 9.2.1 As appropriate to the vessel, the rudder and rudder stock construction materials, design in total (including tiller head attachments, bearings and pintles) and the supporting structures should correspond to the operating conditions for the vessel. Recognised design standards should be used.
- 9.2.2 Construction and fitting standards should be to the satisfaction of the Certifying Authority.

9.3 Propeller System

- 9.3.1 As appropriate to the vessel, propeller line shaft(s) construction materials and design in total (including shaft brackets, propeller securing, bearings, sterntube and thrust block) and supporting structures should correspond to the operating conditions for the vessel. Recognised design standards should be used.
- 9.3.2 Construction and fitting standards should be to the satisfaction of the Certifying Authority.

10 BILGE PUMPING

A decked vessel should be provided with efficient means for removal of bilge water entering any compartment below the weather deck (other than a tank permanently used for carriage of liquids which is provided with efficient means of pumping or drainage). An open boat should be provided with efficient arrangements for dealing with bilge water.

Provided the safety of a vessel is not impaired, the Certifying Authority may permit dispensation from the means of pumping or drainage of particular compartments.

Section 28 contains requirements for prevention of pollution of the sea.

10.1 Vessels of 15 metres in Length and Over

10.1.1 A vessel should have at least two bilge pumps with a combined capacity of not less than 210 litres per minute. One pump should be power driven with a capacity not less than 140 litres per minute, and the other(s) may be hand pump(s) suitable for the suction lift head and of capacity not less than 70 litres per minute.

The arrangements should be such that any one pump is available for duty in an emergency. This will necessitate placing the pumps (as well as source of power if pumps are power pumps) in widely separated spaces or compartments considering that any single event hazard such as collision, flooding of one compartment, engine failure, blackout or fire, should not disable all the pumping systems.

10.1.2 The suction pipes should be so arranged that any compartment can be drained when the vessel is heeled up to an angle of 10°.

10.1.3 A bilge pump (other than a portable pump) should be capable of being operated with all hatchways and companionways closed.

10.1.4 When considered necessary, to protect a bilge suction line from obstruction, an efficient strum box should be fitted.

10.1.5 When considered necessary, to prevent back flooding, bilge suction valves should be of non return type.

10.1.6 Other means of providing efficient bilge pumping (e.g. portable power or hand pumps) may be considered provided that full information is submitted to and approved by the Certifying Authority.

10.2 Vessels of Less than 15 metres in Length

10.2.1 A vessel should have at least two bilge pumps with a combined capacity of not less than 140 litres per minute. One pump may be power driven and the other(s) should be hand pump(s) suitable for the suction lift head and of capacity not less than 70 litres per minute.

The arrangements should be such that any one pump is available for duty in an emergency. This will necessitate placing the pumps in as widely separated spaces or compartments as possible considering that any single event hazard such as collision, flooding of one compartment, engine failure, blackout or fire, should not disable all the pumping systems.

10.2.2 The suction pipes should be so arranged that any compartment can be drained.

10.2.3 A bilge pump (other than a portable pump) should be capable of being operated with all hatchways and companionways closed.

10.2.4 When considered necessary, to protect a bilge suction line from obstruction, an efficient strum box should be fitted.

10.2.5 When considered necessary, to prevent back flooding, bilge suction valves should be of non return type.

10.2.6 Other means of providing efficient bilge pumping (e.g. portable power or hand pumps) may be considered provided that full information is submitted to and approved by the Certifying Authority.

10.3 Bilge Alarms

10.3.1 When propulsion machinery is fitted in an enclosed watertight compartment, a bilge level alarm should be fitted in that compartment.

10.3.2 To prevent pollution, bilge alarms in compartments containing pollutants should not automatically start bilge pumps.

10.3.3 An auto-start bilge pump serving a clean compartment should be fitted with an audible and visual alarm at the control position(s) so that the reason for pumping may be investigated.

10.3.4 Each dry compartment provided with a bilge suction capability (built-in or portable) should be fitted with a bilge level alarm if the level of bilge water can not be readily checked visually without entering the compartment.

10.3.5 A bilge alarm should provide an audible and visual warning at the control position(s).

11 INTACT AND DAMAGE STABILITY

11.1 New Vessels

11.1.1 General

- 11.1.1.1 The standard of stability to be achieved by a new vessel should be dependent on its length, maximum number of persons permitted to be carried, whether cargo is to be carried and the area of operation.
- 11.1.1.2 A vessel of 15 metres in length and over or a vessel of less than 15 metres in length which carries cargo, or a combination of passengers and cargo, weighing more than 1000kg should be provided with stability information which is approved by the Certifying Authority and kept on board the vessel.
- 11.1.1.3 A vessel of less than 15 metres in length which carries cargo, or a combination of passengers and cargo, weighing not more than 1000kg and which is not fitted with a lifting device should be subject to a simplified assessment of stability and is not required to be provided with an approved stability information booklet. Stability for the vessel should be assessed and accepted by the Certifying Authority.
- 11.1.1.4 For stability requirements for a decked vessel fitted with a lifting device see 11.4 and, for a decked vessel engaged in towing see 11.5.
- 11.1.1.5 Stability of a vessel which will operate in sea areas where ice accretion can occur should be specially considered by the Maritime and Coastguard Agency with regard to icing allowance and stability standard. (Also see 6.9.)
- 11.1.1.6 Stability of a vessel of unusual form and/or arrangement should be specially considered by the Maritime and Coastguard Agency.

11.1.2 Intact stability of new vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing more than 1000kg and new vessels of 15 metres in length and over

- 11.1.2.1 The lightship weight, vertical centre of gravity (KG) and longitudinal centre of gravity (LCG) of a monohull vessel should be determined from the results of an inclining experiment.
- 11.1.2.2 The lightship weight and longitudinal centre of gravity (LCG) of a multihull vessel should be obtained by a displacement check or by weighing. The vertical centre of gravity (KG) should be determined either by calculation or by experimental means, noting however that a conventional inclining experiment may not produce satisfactory results.

11.1.2.3 The lightship weight should be increased by a margin for growth, which should be 5% of the lightship weight positioned at the lightship LCG and vertical centre of the weather deck amidships or lightship KG, whichever is the higher. (The lightweight margin should not be used in practice to increase maximum cargo deadweight.)

11.1.2.4 Curves of statical stability (GZ curves) should be produced for:-

- (a) Loaded departure, 100% consumables;
- (b) Loaded arrival, 10% consumables;
- (c) Anticipated service conditions; and
- (d) Conditions involving lifting appliances (when appropriate).

In addition, simplified stability information in the form of a Maximum KG Curve should be provided, including a worked example to illustrate its use.

11.1.2.5 The curves of statical stability for the loaded conditions should meet the following criteria:-

- .1 The area under the righting lever curve (GZ curve) should be not less than 0.055 metre-radians up to 30° angle of heel and not less than 0.09 metre-radians up to 40° angle of heel or the angle of downflooding if this angle is less; and
- .2 the area under the GZ curve between the angles of heel of 30° and 40° or between 30° and the angle of downflooding if this is less than 40°, should be not less than 0.03 metre-radians.
- .3 The righting lever (GZ) should be at least 0.20 metres at an angle of heel equal to or greater than 30°.
- .4 The maximum GZ should occur at an angle of heel of not less than 25°.
- .5 After correction for free surface effects, the initial metacentric height (GM) should not be less than 0.35 metres.

11.1.2.6 If a vessel of catamaran or multihull type does not meet the stability criteria given in 11.1.2.5, the vessel should meet the following criteria:-

- .1 The area under the righting lever curve (GZ Curve) should not be less than 0.085 metre-radians up to $\theta_{GZ_{max}}$ when $\theta_{GZ_{max}} = 15^\circ$ and 0.055 metre-radians up to $\theta_{GZ_{max}}$ when $\theta_{GZ_{max}} = 30^\circ$.

When the maximum righting lever, GZ_{max} , occurs between $\theta = 15^\circ$ and $\theta = 30^\circ$ the required area under the GZ Curve up to $\theta_{GZ_{max}}$ should not be less than:

$$A = 0.055 + 0.002(30^\circ - \theta_{GZ_{max}}) \text{ metre-radians}$$

where: $\theta_{GZ_{max}}$ is the angle of heel in degrees at which the righting lever curve reaches its maximum

- .2 the area under the righting lever curve between $\theta = 30^\circ$ and $\theta = 40^\circ$ or between $\theta = 30^\circ$ and the angle of downflooding θ_f , if this angle is less than 40° , should not be less than 0.03 metre-radians;
- .3 the righting lever GZ should not be less than 0.2 m at an angle of heel of 30° ;
- .4 the maximum righting lever should occur at an angle not less than 15° ; and
- .5 the initial metacentric height GM_o should not be less than 0.35m.

11.1.2.7 A catamaran or multihull type vessel failing to comply with the criteria of either 11.1.2.5 or 11.1.2.6 may be given special consideration. In such a case calculations should be submitted to the Maritime and Coastguard Agency for assessment.

11.1.3 Intact stability of new vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing not more than 1000kg and are not fitted with lifting devices

11.1.3.1 A vessel should be tested in the fully loaded condition (which should correspond to the freeboard assigned) to ascertain the angle of heel and the position of the waterline which results when all persons which the vessel is to be certificated to carry are assembled along one side of the vessel. For the test:-

- .1 The skipper may be assumed to be at the steering position;
- .2 Each person may be substituted by a mass of 75kg;
- .3 If the vessel carries cargo or a combination of cargo and passengers, the combined weight of the cargo, passengers and crew (other than the skipper) should be transferred to one side of the vessel; and
- .4 If seating is provided at the side of the vessel, passengers should be seated and, if there is either insufficient seating or no seating, passengers

and crew should stand close to the side of the vessel without leaning on the bulwark or rails.

The vessel will be judged to have an acceptable standard of stability if the test shows that:-

- .5 the angle of heel does not exceed 7° ; and
- .6 in the case of a vessel with a watertight weather deck extending from stem to stern as described in 4.1.1 and 4.3.1.1, the freeboard to the deck is not less than 75mm at any point; or
- .7 in the case of an open boat as described in 4.1.3, the freeboard to the top of the gunwale (see 12.2.1.3) is not less than 250mm at any point.

11.1.3.2 An open boat (see Section 2 for definition) when loaded to its assigned freeboard mark should have sufficient buoyancy to be able to remain afloat and near upright when totally flooded. The open boat should be deemed by the Certifying Authority to have sufficient buoyancy when detailed calculations are presented and confirmed to show that the total buoyancy is not less than:-

Volume of displacement (to the freeboard mark draught) x 1.1 (cubic metres)

11.1.4 Damage stability of new vessels of 15 metres in length and over or which are certificated to carry 15 or more persons or which are certificated to operate in area category 1

11.1.4.1 A vessel should be provided with watertight bulkheads (see 4.4.1) which are arranged such that minor hull damage which results in the free-flooding of any one compartment, will not cause the vessel to float at a waterline which is less than 75mm below the weather deck at any point. Minor damage should be assumed to occur anywhere in the length of the vessel but not on a watertight bulkhead. Standard permeabilities should be used in this assessment as follows :-

Space	Permeability %
Appropriated for stores	60
Appropriated for stores but not a substantial quantity thereof	95
Appropriated for accommodation	95
Appropriated for machinery	85
Appropriated for liquids	0 or 95 whichever results in the more onerous requirement

- 11.1.4.2 In the damaged condition, the residual stability should be such that the angle of equilibrium does not exceed 7° from the upright, the resulting righting lever curve has a range to the downflooding angle of at least 15° beyond the angle of equilibrium, the maximum righting lever within that range is not less than 100mm and the area under the curve is not less than 0.015 metre radians.
- 11.1.4.3 Calculations of damage stability conditions should be submitted to and approved by the Certifying Authority.

11.2 Existing Vessels

11.2.1 General

The standard of stability required to be achieved by an existing vessel is generally to be as required for a new vessel.

11.2.2 Intact stability of existing vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing more than 1000kg and existing vessels of 15 metres in length and over

Unless a vessel is already provided with stability information which is approved and relevant to the vessel in its present condition, the vessel should be treated as if it is a new vessel.

11.2.3 Intact stability of existing vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing not more than 1000kg and are not fitted with lifting devices

11.2.3.1 Generally, a vessel should be treated as if it is a new vessel.

11.2.3.2 An existing open boat should meet the requirement of 11.1.3.2. In the case of an open vessel for which hull form lines are not available, it should be sufficient to show the Certifying Authority that the total buoyancy is not less than:-

Length (waterline) x Breadth (maximum) x Draught x 0.7 (cubic metres)

The dimensions should be taken at the waterline corresponding to the assigned freeboard.

11.2.3.3 When a vessel fails to meet the standards applied to a new vessel a lesser standard may be accepted by the Certifying Authority, provided that the vessel, in its present condition, has a record of at least five years' history of safe operation in the service area whilst carrying out similar types of operations.

Such a vessel should be restricted to a service area defined from a nominated departure point(s), except that provision may be made for the vessel to be moved between designated operating sites subject to specified conditions being met. The nominated departure point(s) and permitted movement between operating sites should be recorded on the certificate for the vessel together with any conditions which may be applied e.g. "favourable weather"; no cargo when moving between operating sites.

11.2.4 Damage stability of existing vessels of 15 metres in length and over or which are certificated to carry 15 or more persons or certificated to operate in area category 1

It is most strongly recommended that modifications which cause the vessel to meet the standard given in 11.1.4 be implemented when the vessel undergoes major structural alterations. (Also see 4.4.2.)

11.3 Inflatable Boats (New and Existing)

The requirements apply to a new or an existing inflatable boat or rigid inflatable boat.

Unless an inflatable boat or rigid inflatable boat is completely in accordance with a standard production type, for which the Certifying Authority is provided with a certificate of approval for the tests which are detailed below, the tests required to be carried out on a boat floating in still water are:-

11.3.1 Stability tests

The tests should be carried out with the engine and fuel tank fitted or replaced with an equivalent mass. Each person may be substituted by a mass of 75kg for the purpose of the tests:-

- 11.3.1.1 The number of persons and the amount of cargo and stores for which an inflatable boat or rigid inflatable boat is to be certified should be moved to one side half the number of persons to be carried should be seated on the buoyancy tube.

This procedure should be repeated with the persons and the cargo on the other side and similar tests should be carried out with persons and cargo successively at each end of the inflatable boat or rigid inflatable boat.

In each case the freeboard to the top of the buoyancy tube should be recorded. Under these conditions the freeboard should be positive around the entire periphery of the inflatable boat or rigid inflatable boat.

11.3.1.2 Two persons should recover a third person from the water into the inflatable boat or rigid inflatable boat.

The third person should feign to be unconscious and be back towards the inflatable boat or rigid inflatable boat so as not to assist the rescuers. Each person involved should wear an approved lifejacket.

The stability of the inflatable boat or rigid inflatable boat should remain positive throughout the recovery.

11.3.2 Damage tests

The tests should be carried out with an inflatable boat or rigid inflatable boat loaded with the number of persons and cargo for which it is to be certificated. The engine, fuel tank and full fuel should be fitted, or replaced by an equivalent mass, and all equipment appropriate to the use of the inflatable boat or rigid inflatable boat.

The tests will be successful if, for each condition of simulated damage, the persons for which the inflatable boat or rigid inflatable boat is to be certificated are supported within the inflatable boat or rigid inflatable boat. The conditions are:-

- .1 with forward buoyancy compartment deflated;
- .2 with the entire buoyancy on one side of the inflatable boat or rigid inflatable boat deflated; and
- .3 with the entire buoyancy on one side of the bow compartment deflated (where the division of the inflated tube is appropriate to this test).

11.3.3 Buoyancy test

11.3.3.1 It should be demonstrated that an inflatable boat or rigid inflatable boat, when fully swamped, is capable of supporting its fully laden displacement.

11.3.3.2 In the swamped condition the inflatable boat or rigid inflatable boat should not be seriously deformed.

11.3.3.3 The drainage system should be demonstrated at the conclusion of this test.

11.4 Vessel Fitted with a Deck Crane or other Lifting Device

11.4.1 Reference should be made to Section 25.4 for requirements for safety standards other than stability for a vessel fitted with a deck crane or other lifting device.

11.4.2 A vessel fitted with a deck crane or other lifting device should be a decked vessel and comply with the general requirements of Section 11 which are appropriate to it.

In addition, the following requirements should be met:-

- .1 With the vessel in the worst anticipated service condition for lifting operations, a practical test should be undertaken to establish the maximum angle of heel and the minimum freeboard on the low side.
- .2 With the crane or other lifting device operating at its maximum load moment, the angle of heel generally should not exceed 7° or that angle of heel which results in a freeboard on the low side of 250mm, whichever is the lesser angle. (Consideration should be given to the operating performance of cranes or other lifting devices of the variable load-radius type.)
- .3 When an angle of heel greater than 7° but not exceeding 10° occurs, the Certifying Authority may accept the lifting condition providing that all the following criteria are satisfied when the crane or other lifting device is operating at its maximum load moment :-
 - .1 the range of stability from the angle of static equilibrium is equal to or greater than 20° ;
 - .2 the area under the curve of residual righting lever, up to 40° from the angle of static equilibrium or the downflooding angle, if this is less than 40° , is equal to or greater than 0.01 metre-radians; and
 - .3 the minimum freeboard fore and aft throughout the lifting operations should not be less than half the assigned freeboard at amidships. For vessels with less than 1000mm assigned freeboard amidships the freeboard fore or aft should not be less than 500mm.

11.4.3 Information and instructions to the skipper on vessel safety when using a deck crane or other lifting device should be included in the stability information booklet. The information and instructions should include:-

- .1 the maximum permitted load and outreach which satisfy the requirements of 11.4.2, or the Safe Working Load (SWL), whichever is the lesser (operating performance data for a crane or other lifting device of variable load-radius type should be included as appropriate.);

- .2 details of all openings leading below deck which should be secured weathertight; and
- .3 the need for all personnel to be above deck before lifting operations commence.

11.4.4 Requirements for a lifting system which incorporates counterbalance weight(s) should be specially considered by the Maritime and Coastguard Agency.

11.5 Vessel Engaged in Towing

11.5.1 Reference should be made to Section 25.2 for requirements for safety standards other than stability for a vessel engaged in towing.

11.5.2 Generally, a vessel engaged in towing should be a decked vessel and comply with the general requirements of Section 11 which are appropriate to the vessel.

11.5.3 The danger to safety of deck edge immersion makes an open boat unsuitable for towing other vessels or floating objects.

11.6 Approval of Intact and Damage Stability

11.6.1 A vessel not required to have an approved stability information booklet

A vessel for which stability is assessed on the basis of practical tests defined in Section 11 of the Code, conducted by a competent person(s), should be approved by Certifying Authority. In order to give approval, the Certifying Authority should be satisfied that the requirements have been met by witnessing the practical tests, accepting the results obtained and keeping a detailed record of the procedure of the tests and the results which were accepted.

The Certifying Authority should file the detailed record of the test in the records retained for the vessel.

11.6.2 A vessel required to have an approved stability information booklet

11.6.2.1 The owner(s) should be responsible for the inclining test of a vessel to be undertaken by competent persons and for the calculation of the lightship particulars which are used in the stability calculations.

11.6.2.2 The Certifying Authority should witness the inclining test of a vessel and be satisfied as to conditions and the manner in which the test is conducted. The Certifying Authority should report formally to the owner(s) that the inclining test

was conducted and valid results obtained, to the satisfaction of the authorised person who witnessed the test.

- 11.6.2.3 The owner(s) of a vessel should be responsible for the submission of the stability information booklet prepared by a competent person(s), the content and form in which stability information is presented, its accuracy and its compliance with the requirements of Section 11 for the standard required for the vessel.

The owner(s) should submit three (3) copies of the booklet to the Certifying Authority for approval.

- 11.6.2.4 When satisfied with the form and content of the stability information booklet (including satisfaction with the competency of the person(s) who produced the booklet, methods and procedures used for calculations, the stability standard achieved and instructions which may be given to the skipper but excluding accuracy of calculations), the Certifying Authority should stamp the booklet with an official stamp which contains the name of the Certifying Authority, the date of approval, a file (or record) reference, number of pages in the booklet and "APPROVED FORM AND CONTENT".

Two (2) copies of the approved booklet should be returned to the owner(s). The owners should be instructed to confirm that one (1) copy has been placed on the vessel and will be retained on the vessel at all times for use by the skipper. The second booklet is for the record of the owner(s).

The Certifying Authority should retain the third copy of the approved booklet in the records kept for the vessel.

11.6.3 A vessel required to have approved damage stability information

- 11.6.3.1 The owner(s) of a vessel should be responsible for the submission of the damage stability calculations prepared by a competent person(s), their accuracy (including methods and procedures used for calculations) and compliance with the requirements of 11.1.4 or 11.2.4 as appropriate.

The owner(s) should submit two (2) copies of the calculations to the Certifying Authority for approval.

- 11.6.3.2 The Certifying Authority should approve the results of the damage stability cases provided the results meet the standard defined in 11.1.4.

Approval (of the results but not the accuracy of the calculations) should be given in a formal letter from the Certifying Authority to the owner(s) and a copy of the calculations returned marked with the name of the Certifying Authority, the date and "RESULTS APPROVED".

11.6.4 Monitoring of accuracy of intact and damage stability calculations

As agreed with the Maritime and Coastguard Agency, a Certifying Authority should carry out controlled monitoring of the accuracy of intact and damage calculations submitted to them by the owner(s)/competent person(s). Monitoring includes detailed checks by independent calculations.

In the event that monitoring reveals errors in the calculations for a vessel, the Certifying Authority should be entitled to reimbursement by the owner(s) of the cost incurred by it in either overseeing and/or carrying out the remedial measures necessary to rectify the errors and approve the calculations.

12 FREEBOARD AND FREEBOARD MARKING

12.1 General

Other than an inflatable boat or a rigid inflatable boat covered by 12.4 and a vessel operating in protected waters and/or restricted service covered by 12.5, a vessel should have a deck line and freeboard mark on each side of the vessel at amidships.

12.2 Minimum Freeboard

The freeboard should be not less than that determined by the following requirements :-

12.2.1 New vessels which carry cargo or a combination of passengers and cargo weighing not more than 1000kg

A new vessel, other than an inflatable or rigid inflatable boat covered by 12.4, when in still sea water of relative density 1.025 and fully loaded with cargo and non-cargo deadweight items certificated to be carried (each person taken as 75kg) should be upright and :-

- .1 in the case of a vessel with a continuous watertight weather deck in accordance with 4.3.1.1, which is neither stepped nor recessed nor raised, have a freeboard measured down from the lowest point of the weather deck of not less than 300mm for vessels of 7 metres in length or under and not less than 750mm for vessels of 18 metres in length or over. For a vessel of intermediate length the freeboard should be determined by linear interpolation;
- .2 in the case of a vessel with a continuous watertight weather deck in accordance with 4.3.1.2, which may be stepped, recessed or raised, have a freeboard measured down from the lowest point of the weather deck of not less than 200mm for vessels of 7 metres in length or under and not less than 400mm for vessels of 18 metres in length or over. For a vessel of intermediate length the freeboard should be determined by linear interpolation. The raised portion(s) of the watertight weather deck should extend across the full breadth of the vessel and the average freeboard over the length of the vessel should comply with .1 above for a vessel with a continuous watertight weather deck.
- .3 in the case of an open boat, have a clear height of side (i.e. the distance between the waterline and the lowest point of the gunwale*) of not less than 400mm for vessels 7 metres in length or under and not less than

800mm for vessels 18 metres in length or over. For a vessel of intermediate length the clear height should be determined by linear interpolation.

* (The clear height of the side should be measured to the top of the gunwale or capping or to the top of the wash strake if one is fitted above the capping.)

12.2.2 Existing vessels which carry cargo or a combination of passengers and cargo weighing not more than 1000kg

- .1 Generally, an existing vessel should comply with 12.2.1.
- .2 In the case of an existing vessel which is unable to comply with 12.2.1, the Certifying Authority may be prepared to consider a lesser standard of 'operational freeboard' or 'clear height of side'. However, in such a case it will be necessary for the owner/managing agent to provide the Certifying Authority with a detailed account of the operational history of the vessel. This detailed account should include sea areas normally visited, loaded draught/freeboard/height of side, number of persons usually carried, number of years employed in this mode, together with other details which may be considered relevant.
The area of operation for the vessel may be restricted to correspond to the service history. The area of operation should be recorded on the certificate.

Details of such cases should be reported to the Maritime and Coastguard Agency.

12.2.3 New and existing vessels which carry cargo or a combination of passengers and cargo weighing more than 1000kg

Freeboard should be assigned in accordance with the Merchant Shipping (Load Line) Regulations 1998.

A vessel should have a scale of draught marks marked clearly at the bow and stern.

12.2.4 All vessels

A vessel should be assigned a freeboard which corresponds to the draught of the vessel in sea water when fully loaded (each person taken as 75kg), minus 25mm, but which in no case should be less than the freeboard required by 12.2.1, 12.2.2. or 12.2.3.

12.3 Freeboard Mark and Loading

12.3.1 A vessels assigned a freeboard in accordance with 12.2.3 should be marked with a deck line and freeboard mark in accordance with the Merchant Shipping (Load Line) Regulations 1998 and have a scale of draught marks marked clearly at the bow and stern, on both sides of the vessel.

The deck line and freeboard mark should be permanent and painted red on a contrasting background.

No mark should be applied for fresh water allowance.

The assigning letter marking on the bar of the ring and bar should be D on the left and T on the right when the Maritime and Coastguard Agency is the Certifying Authority. In the case of any other Certifying Authority the assigning letters should be U on the left and K on the right.

12.3.2 The freeboard mark for vessels other than 12.3.1 should be a bar of 300mm in length and 25mm in depth.

The marking should be permanent and painted black on a light background or in white or yellow on a dark background. (No assigning letter marking should be placed on the bar marking.)

The top of the mark should be positioned at the waterline corresponding to the draught referred to in 12.2.1 and 12.2.2, at amidships.

12.3.3 A vessel should not operate in a condition which will result in its freeboard marks being submerged when it is at rest and upright in calm sea water.

12.4 Inflatable Boats and Rigid Inflatable Boats which Carry Cargo or a Combination of Passengers and Cargo Weighing not more than 1000kg

12.4.1 The freeboard of an inflatable boat or rigid inflatable boat should be not less than 300mm measured from the upper surface of the buoyancy tubes and not less than 250mm at the lowest part of the transom with the inflatable boat or rigid inflatable boat in the following conditions and with the drainage socks (if fitted) tied up:-

- .1 the inflatable boat or rigid inflatable boat with all its equipment;
- .2 the inflatable boat or rigid inflatable boat with all its equipment, engine and fuel, or replaced by an equivalent mass;
- .3 the inflatable boat or rigid inflatable boat with all its equipment, cargo and number of persons (each person taken as 75kg) for which it is to be

certificated, so arranged that a uniform freeboard is achieved at the side buoyancy tubes; and

- .4 the inflatable boat or rigid inflatable boat with all its equipment cargo and number of persons for which it is to be certificated, engine and fuel, or replaced by an equivalent mass, and the inflatable boat retrimmed as necessary to represent a normal operating condition.

12.4.2 A freeboard mark is not required. The minimum freeboards recorded during the tests of 12.4.1 and the permissible maximum weight which can be carried should be recorded on the certificate for the vessel.

12.5 Vessels Operating in Protected Waters and/or a Restricted Service

12.5.1 Subject to Section 3.7 and the guidance given in Annex 2, when appropriate, the freeboard of vessels should be assessed in accordance with 12.2 or 12.4.

12.5.2 A freeboard mark is not required for a vessel which carries cargo or a combination of passengers and cargo weighing not more than 1000kg, unless the safety standards set for the special case require it. The minimum freeboard and permissible maximum weight which can be carried should be recorded on the certificate for the vessel.

13 LIFE-SAVING APPLIANCES

- 13.1 Life-saving appliances should be provided in accordance with Annex 3.
- 13.2 Inflatable liferafts, hydrostatic release units (other than the types which have a date limited life and are test "fired" prior to disposal) and gas inflatable lifejackets should be serviced annually at a service station approved by both the manufacturer and the Maritime and Coastguard Agency.
- 13.3 Lifejackets which are not Maritime and Coastguard Agency (DETR) approved should comply with BS EN 396 of 150N or BS EN 399 of 275N and be fitted with a whistle, light and retro-reflective tape.
- 13.4 Life-saving appliances should be of a type which has been approved/accepted by the Maritime and Coastguard Agency (DETR), unless there is specific reference to other acceptable types.

14 FIRE SAFETY

14.1 Machinery Space

14.1.1 Construction - new vessels

- 14.1.1.1 **Steel Construction:** Vessels which have the machinery space boundaries constructed of steel, require no additional fire protection. However, surfaces on the opposite side of the machinery space should only be coated with finishes which have a Class 1 surface spread of flame rating when tested in accordance with BS 476 Part 7:1987 - Method for the classification of the surface spread of flame of products.
- 14.1.1.2 **Glass Reinforced Plastic (GRP) Construction:** Machinery space boundaries should prevent the passage of smoke and flame for 15 minutes, when tested in accordance with the procedure shown in Annex 4. Fire resistance of GRP may be achieved by the use of woven roving glass layers or additives to the resin. Intumescent polyester resin surface coatings may also be used; however, solvent borne intumescent paints are not acceptable. The Certifying Authority may waive the requirement for the test described in Annex 4 if the construction complies with an ISO or equivalent standard to give at least the same level of protection.
- 14.1.1.3 **Aluminium and Wood Construction:** Machinery space boundaries should have an equivalent level of fire protection when compared to GRP construction. Where insulation is fitted to provide this equivalent level of fire protection (Maritime and Coastguard Agency approved A-15 insulation provides this equivalence, without the test required by 14.1.5.2) the insulation need not be fitted lower than 300mm below the light waterline.
- 14.1.1.4 Machinery space boundaries should be reasonably gastight so that in the event of a fire the fire extinguishing medium released/injected can be retained for sufficient time to extinguish the fire.

14.1.2 Construction - existing vessels

- 14.1.2.1 Machinery space boundaries should be reasonably gastight so that in the event of a fire the fire extinguishing medium released/injected can be retained for sufficient time to extinguish the fire.
- 14.1.2.2 Where it is not practical to have a machinery space, the engine should be enclosed in a box. The box should perform the same function as the machinery space boundaries in 14.1.2.1.

14.1.3 Stowage of materials

Combustible materials not required for the operation and maintenance of machinery, should not be stowed in the machinery space. Any materials stowed in the machinery space should be properly secured and cause no obstruction to access in or from the space.

14.1.4 Windows

Portlights or windows should not be fitted in the boundary of the machinery space, except that an observation port having a maximum diameter of 150mm may be fitted, provided the frame is constructed of steel or brass and the port is fitted with a permanently attached steel or brass cover with securing arrangements.

14.1.5 Insulation

- 14.1.5.1 Insulating materials fitted in the machinery space of new vessels should be non-combustible when tested in accordance with BS 476 Part 4:1970 - Non-combustibility test for materials. Insulating materials fitted in the engine space of existing vessels should not be readily ignitable. Insulation should be covered with a vapour barrier impervious to oil or oil vapour.
- 14.1.5.2 Any insulation composite may be considered not readily ignitable if the test defined in Annex 5 is carried out on a representative specimen and the result is satisfactory. In such testing, the specimen edge need not be tested where the insulation is fitted without exposed edges and specimen conditioning may be curtailed as appropriate to the material under test. (14.1.1.3 deals with extent of insulation on vessels of non-steel construction.)
- 14.1.5.3 On existing vessels where insulation is readily ignitable, it should be replaced as soon as possible, but not later than 2 years from the date of coming into force of the Codes enabling legislation.

14.1.6 Cleanliness (also see Section 28)

- 14.1.6.1 Machinery containing oil should be provided with a readily accessible galvanised steel drip tray or other suitable means to collect and retain leakages containing oil.
- 14.1.6.2 The machinery space should be kept clean and tidy. Oily water should be collected and properly disposed of ashore.

14.2 Galley Area

14.2.1 Materials which are in the vicinity of an open flame cooking appliance should be non-combustible, except that these materials may be faced with any surface finish having a Class 1 surface spread of flame rating when tested in accordance with BS 476 Part 7:1997 - Method of test to determine the classification of the surface spread of flame of products.

14.2.2 Combustible materials and other surfaces which do not have a Class 1 surface spread of flame rating should not be left unprotected within the following distances of the cooker:-

- .1 400mm vertically above the cooker, for horizontal surfaces, when the vessel is upright.
- .2 125mm horizontally from the cooker, for vertical surfaces.

14.2.3 Curtains should not be fitted within 600mm of an open flame cooking appliance.

14.3 Furnishing Materials

14.3.1 Upholstery composites should satisfy the requirements of BS EN 1021:1994 - Assessment of the ignitability of upholstered furniture, or BS 5852 Part 1:1979 - Methods of test for assessment of the ignitability of upholstered seating by smouldering and flaming ignition sources, or equivalent. On existing vessels replacement of existing upholstery or mattresses may be delayed until renewal.

14.4 Means of Escape

14.4.1 Each accommodation space and each manned machinery space should be provided with two means of escape. The means of escape should be such that a single hazardous event will not cut-off both escape routes. Only in an exceptional case should one means of escape be accepted. Such a case would be when the single escape is to the open air or when the provision of a second means of escape would be detrimental to the overall safety of the vessel.

14.4.2 In the exceptional case when a single means of escape is accepted, efficient smoke detectors should be provided as necessary to give early warning of a fire emergency which could cut off the single means of escape from a space. (See 14.6.2.)

14.4.3 Means of escape should be clearly marked for their purpose and the function of each escape demonstrated by practical tests to the satisfaction of the Certifying Authority.

14.5 Open Flame Gas Appliances

14.5.1 Open flame gas appliances provided for cooking, heating or any other purposes should comply with the requirements of EC Directive 90/396/EEC - Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to appliances burning gaseous fuels, so far as the requirements of the Directive apply to any particular appliance.

14.5.2 Installation of an open flame gas appliance should comply with the provisions of Annex 6.

14.6 Smoke and Heat Detection

14.6.1 Efficient smoke and/or heat detectors as appropriate to the hazard(s) should be fitted in the machinery space(s) and spaces containing open flame cooking and/or heating devices. Such smoke and/or heat detectors should give audible warning at the control position.

14.6.2 Efficient smoke detectors may be required in order to comply with 14.4.2. Such smoke detectors should give audible warning in the spaces they are protecting and at the control position.

15 FIRE APPLIANCES

15.1 General

- 15.1.1 A vessel should be provided with efficient fire fighting equipment in accordance with Annex 7.
- 15.1.2 Unless a fixed fire extinguishing system is fitted in the machinery space, provision should be made in the boundary of the space for discharging a fire extinguishing medium into the machinery space.

15.2 Provision for Fire Extinguishing in Machinery Spaces

When a fixed fire extinguishing system (which is not a portable extinguisher) is installed in a machinery space, it should be a Maritime and Coastguard Agency (DETR) or equivalent approved type appropriate to the space to be protected.

The requirements for fixed fire extinguishing installations are detailed in the Merchant Shipping Regulations (e.g. the Merchant Shipping (Fire Protection) Regulations 1980 and 1984, SI 1980 No.544, and SI 1984 No.1218, and in the 1992 edition of "Survey of fire protection arrangements in merchant ships - Instructions for the guidance of surveyors" (HMSO publication ISBN 0 11 550949 6).

Fixed installations in machinery spaces covered by the references are:-

- .1 low expansion foam;
- .2 medium expansion foam;
- .3 high expansion foam;
- .4 carbon dioxide;
- .5 pressure water spraying; and
- .6 vaporising fluids.

16 RADIO EQUIPMENT

16.1 General Requirements

16.1.1 Radio equipment carried by a vessel should be capable of fulfilling the following functional requirements with respect to distress and safety communications when the vessel is at sea:-

- .1 Provide for the safety of the vessel by:-
 - .1 performing ship-to-shore distress alerting;
 - .2 transmitting ship-to-ship distress alerting;
 - .3 transmitting and receiving on-scene communications, including appropriate search and rescue co-ordinating communications; and
 - .4 transmitting locating signals.
- .2 Assist other vessels in distress by:-
 - .1 receiving shore-to-ship distress alerting; and
 - .2 receiving ship-to-ship distress alerting.
- .3 Receive navigational and meteorological warning and urgent safety information (Maritime Safety Information - MSI).

16.1.2 The Global Maritime Distress and Safety System (GMDSS) will be fully implemented on 1 February 1999. The implementation of GMDSS will mean the adoption of Digital Selective Calling (DSC) for distress alerting in maritime radio frequency bands e.g. VHF.

Whilst the United Kingdom Coastguard is expected to continue coverage of VHF channel 16 for the foreseeable future after 1 February 1999, ships and other search and rescue authorities may not.

Therefore, for operations outside of VHF range of United Kingdom Coastguard stations, owner(s)/managing agent(s) are strongly recommended to install DSC to provide adequate safety communications.

16.2 Radio Installation

- 16.2.1 Table 1 lists the minimum and recommended radio equipment for the Code area categories of operation, which fulfil the functional requirements specified in 16.1.
- 16.2.2 Owner(s)/managing agent(s) responsible for the safe operation of vessels are advised that, under certain circumstances e.g. VHF radio 'black-spots', the radio equipment specified in Table 1 may have limitations.
- 16.2.3 VHF transmission and reception ranges are reliable only within the line of sight ranges (see the Admiralty List of Radio Signals Vol.6 Part 1, an extract of which is copied in Merchant Shipping Notice No. M.1632 - Proper use of VHF channels at sea). Vessels operating outside these ranges and equipped only with the minimum radio fit will have to rely on VHF relay via other vessels to communicate with a coast station and this cannot be guaranteed.
- 16.2.4 Aerials should be mounted as high as is practicable to maximise performance.
- 16.2.5 Skippers should be aware of VHF coverage in the intended areas of operation. Where the certainty of good VHF coverage in the UK coastal area is in doubt, skippers should seek advice from the Certifying Authority (16.2.9) on whether Medium Frequency (MF) or other equipment with long range transmission capability should be carried.
- 16.2.6 When the electrical supply to radio equipment is from a battery, charging facilities (which are capable of recharging them to minimum capacity requirements within 10 hours) or a duplicate battery of capacity sufficient for the voyage should be provided.

The battery electrical supply to radio equipment should be protected against flooding/swamping as far as practicable and arranged so that radio communications are not interrupted. When the efficiency of the required protection against flooding/swamping cannot be guaranteed with batteries located below the freeboard deck, an efficiently protected battery electrical supply to the radio equipment should be provided above the freeboard deck.

When fully charged, the batteries should provide at least the minimum required hours of operation to ensure effective use of the GMDSS installation.

- 16.2.7 A card or cards giving a clear summary of the radio-telephone distress, urgency and safety procedures should be displayed in full view of the radio-telephone operating position(s).

Guidance on the format of suitable cards is given in Merchant Shipping Notice No. M.1119 - Radiotelephone distress procedure.

Brief and clear operating instructions should be provided for the hand-held VHF required by Annex 3 - Life-saving Appliances.

Attention is drawn to the recommendations on the proper use of VHF channels at sea contained within Merchant Shipping Notice M.1632 - Proper use of VHF channels at sea.

16.2.8 A radio installation should be clearly marked with the call sign, the vessel station identity and any other codes applicable to the use of the radio installation.

16.2.9 In relation to radio installations, the appropriate Certifying Authority is one appointed by the Maritime and Coastguard Agency for the specific purpose of radio installations, as described in Merchant Shipping Guidance Notice No. MGN.11 - Changes to delegation of the radio survey service.

TABLE 1

MINIMUM AND RECOMMENDED RADIO EQUIPMENT

(Additional to the requirements of Annex 3 - Life-Saving Appliances.)

Area of operation category	6	3, 4 & 5	2	1
m = nautical miles	Up to 3m	Up to 20m	Up to 60m	Up to 150m
VHF fixed radio installation - fitted with DSC no later than 1 February 1999 *	R	1	1	1
MF SSB radio telephone - fitted with DSC no later than 1 February 1999 **	None	None	R	R
NAVTEX receiver	None	None	R	R
Search and Rescue Transponder (SART) ***	None	R	R	Required by Annex 3

R = Recommended

* Digital Selective Calling (DSC) recommended after 1 February 1999. The UK Coastguard are expected to continue coverage of VHF Channel 16 for sometime after 1999. However ships will not be providing coverage on VHF Channel 16. Therefore for operations outside the range of UK Coastguard stations the owner or managing agent is strongly recommended to fit DSC to provide adequate safety communications.

** Suitable satellite communications equipment may be fitted as an alternative to this equipment e.g. INMARSAT-C.

*** Recommended after 1 February 1999 in Area Category 2, 3, 4 and 5.

17 NAVIGATION LIGHTS, SHAPES AND SOUND SIGNALS

- 17.1 A vessel should comply with the requirements of the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996, SI 1996, No.75.
- 17.2 Sound signalling equipment should comply with the Regulations. A vessel of less than 12 metres in length is not obliged to carry the sound signalling equipment required by the Regulations on the condition that some other means of making an efficient sound signal is provided.
- 17.3 If it can be demonstrated to the Certifying Authority that, for a particular vessel, full compliance with the Regulations is impracticable, proposal for an equivalent arrangement should be made to the Maritime and Coastguard Agency.
- 17.4 Annex 8 is a summary table of navigation lights, shapes and sounds signalling appliances for power driven vessels.

18 NAVIGATIONAL EQUIPMENT

18.1 Magnetic Compass

A vessel should be fitted with an efficient magnetic compass and valid deviation card complying with the following requirements as appropriate and having due regard for the guidance given in Merchant Shipping Notice No. M.1631 - Operating, maintaining and testing magnetic compasses:-

- 18.1.1 In a steel vessel, it should be possible to correct the compass for co-efficients B, C and D and heeling error;
- 18.1.2 The magnetic compass or a repeater should be fitted with an electric light and so positioned as to be clearly readable by the helmsman at the main steering position;
- 18.1.3 Means should be provided for taking bearings as nearly as practicable over an arc of the horizon of 360°. (This requirement may be met by the fitting of a pelorus or, in a vessel other than a steel vessel, a hand bearing compass.)

18.2 Other Equipment

A vessel which operates more than 20 miles from land (area category 1 or 2) should be provided with:-

- .1 a radio navigation aid appropriate for the area of operation;
- .2 an echo sounder; and
- .3 a distance measuring log except that this need not be provided where the navigational aid in .1 provides reliable distance measurements in the area of operation of the vessel.

19 MISCELLANEOUS EQUIPMENT

19.1 Nautical Publications

19.1.1 Vessels of 12 metres in length and over

A vessel of 12 metres or more in length should comply with the requirements of the Merchant Shipping (Carriage of Nautical Publications) Rules 1975, SI 1975 No.700.

Charts and publications carried should be appropriate to the work of the vessel and its intended area of operation, except that vessels operating in area category 6 need not carry publications.

19.1.2 Vessels of less than 12 metres in length

A vessel of less than 12 metres in length, to which the requirements of 19.1.1 do not apply, should carry up to date charts appropriate for the service area.

Also, the vessel should carry:-

tide tables, a tidal stream atlas and a list of radio signals appropriate to the service area; and

a copy of the international code of signals.

(These items may be contained in a Nautical Almanac.)

19.2 Signalling Lamp

A vessel should be provided with an efficient waterproof electric torch suitable for morse signalling.

19.3 Radar Reflector

A vessel should be provided with an efficient radar reflector.

Reference should be made to Merchant Shipping Notice No. M.1638 - Radar reflectors for small vessels, with respect to the provision of radar reflectors on small vessels.

19.4 Measuring Instruments

A vessel operating in area category 1 or 2 should carry a barometer.

19.5 Searchlight

A vessel operating in area category 1, 2, 3 or 6 should be provided with an efficient fixed and/or portable searchlight suitable for use in manoverboard search and recovery operations.

20 ANCHORS AND CABLES

20.1 General

The requirements are given in Annex 9. The main anchor(s) should be stowed ready for deployment.

20.2 Anchors

20.2.1 The anchor sizes given in Annex 9 are for high holding power (HHP) types.

20.2.2 When a fisherman type of anchor is provided, the mass given in Annex 9 should be increased by 75% but the diameter of the anchor cable need not be increased.

20.2.3 When a vessel has an unusually high windage due to any combination of high freeboard, large superstructure or deck equipment outfit, the mass of anchor given in Annex 9 should be increased to take account of the increase in wind loading.

For vessels of unusual or non-conventional ship form (including pontoon barges) the anchor size should be to the satisfaction of the Certifying Authority.

The diameter of the anchor cable should be appropriate to the increased mass of anchor.

20.3 Cables

20.3.1 The length of anchor cable attached to an anchor should be appropriate to the area of operation but generally should be not less than 4 x the vessel length overall or 30 metres, whichever is the longer, for each of the main and kedge anchors.

20.3.2 The strength, form and material of the anchor cable and its attachments to the anchor and the vessel should be approved by the Certifying Authority and test certificates provided as required.

20.3.3 When the anchor cable is of fibre rope or wire, there should be not less than 10 metres of chain between the rope and the anchor.

20.4 Towline

A vessel should be provided with a towline of not less than the length and diameter of the kedge anchor cable. The towline may be the warp for the kedge anchor.

20.5 Operational

20.5.1 When an anchor mass is more than 30 kg, an efficient mechanical means should be provided for handling the anchor.

20.5.2 There should be a strong securing point on the foredeck and a fairlead or roller at the stem head which can be closed over the cable.

20.5.3 Operating area Category 1, 2 and 3

- .1 A vessel should be provided with at least two anchors (one main and one kedge or two main) and cables, subject to 20.1 and in accordance with the requirements of Annex 9.
- .2 Anchors of equivalent holding power may be proposed and provided, subject to approval by the Certifying Authority.

20.5.4 Operating area Category 4, 5 and 6

A vessel operating in area category 4 and 5 (restricted to operations in favourable weather and daylight), or a vessel operating in area category 6, should be provided with at least two anchors (one main and one kedge or two main), the masses of which may be not less than 90% of the requirements of Annex 9, corresponding cables and subject to approval by the Certifying Authority.

21 ACCOMMODATION

21.1 General

21.1.1 Hand holds and grab-rails

There should be sufficient hand holds and grab-rails within the accommodation to allow safe movement around the accommodation when the vessel is in a seaway.

21.1.2 Securement of heavy equipment

21.1.2.1 Heavy items of equipment such as batteries, cooking appliances etc., should be securely fastened in place to prevent movement due to severe motions of the vessel.

21.1.2.2 Stowage lockers containing heavy items should have lids or doors with secure fastening.

21.1.3 Access/escape arrangements

Means of escape from accommodation spaces should satisfy the requirements of 5.3.1, 5.3.3 and 14.4.

21.1.4 Ventilation

Effective means of ventilation should be provided to enclosed spaces which may be entered by persons on board.

21.2 Vessels at Sea for more than 24 hours

When a vessel is intended to be at sea for more than 24 hours an adequate standard of accommodation for all on board should be provided. In considering such accommodation, primary concern should be directed towards ensuring the health and safety aspects of persons e.g. the ventilation, lighting, water services, galley services and the access/escape arrangements. In particular the following standards should be observed:-

21.2.1 Ventilation

Mechanical ventilation should be provided to accommodation spaces which are situated completely below the level of the weather deck (excluding any coach roof) on vessels which carry berthed persons below deck. As far as practicable,

such ventilation arrangements should be designed to provide at least 6 changes of air per hour when the access openings to the spaces are closed.

21.2.2 Lighting

An electric lighting system should be installed which is capable of supplying adequate light to all enclosed accommodation and working spaces.

21.2.3 Water services

21.2.3.1 An adequate supply of fresh drinking water should be provided and piped to convenient positions throughout the accommodation spaces.

21.2.3.2 In addition, an emergency (dedicated reserve) supply of drinking water should be carried at the rate of 2 litres per person on board.

21.2.4 Sleeping accommodation

A bunk or cot should be provided for each person on board and at least 50% of those provided should be fitted with lee boards or lee cloths.

21.2.5 Galley

21.2.5.1 A galley should be fitted with a means for cooking and a sink and have adequate working surfaces for the preparation of food.

21.2.5.2 When a cooking appliance is gimballed it should be protected by a crash bar or other means to prevent it being tilted when it is free to swing and a strap, portable bar or other means should be provided to allow the cook to be secured in position, with both hands free for working, when the vessel is rolling. Means should be provided to isolate the gimbaling mechanism.

21.2.5.3 There should be secure storage for food in the vicinity of the galley.

21.2.6 Toilet facilities

21.2.6.1 Adequate toilet facilities, separated from the rest of the accommodation, should be provided for persons on board.

21.2.6.2 In general, there should be at least one marine type flushing water closet and one wash hand basin for every 12 persons.

21.2.7 Stowage facilities for personal effects

Adequate stowage facilities for clothing and personal effects should be provided for each person on board.

22 PROTECTION OF PERSONNEL

22.1 Deckhouses

A deckhouse used for accommodation of persons should be of efficient construction.

22.2 Bulwarks, Guard Rails and Handrails

22.2.1 The perimeter of an exposed deck should be fitted with bulwarks, guard rails or guard wires of sufficient strength and height for the safety of persons on deck. Bulwarks, guardrails and guard wires should be supported efficiently by stays or stanchions. When application of such measures would impede the proper working of the vessel, alternative safety measures should be considered.

22.2.2 To protect persons from falling overboard, and when the proper working of the vessel is not impeded and there are persons frequently on the deck, bulwarks or three courses of rails or taut wires should be provided and the bulwark top or top course should be not less than 1000mm above the deck (in accordance with Load Line rules). The distance between the lowest course and the deck should not exceed 230mm and distance between other courses should not exceed 380mm.

22.2.3 In a vessel fitted with a cockpit which opens aft to the sea, additional guardrails should be fitted so that there is no unprotected vertical opening (i.e. between vertical 'members') greater than 500mm in width.

22.2.4 Access stairways, ladderways and passageways should be provided with handrails.

22.2.5 In an inflatable boat or a rigid inflatable boat, handgrips, toeholds and handrails should be provided as necessary to ensure safety of all persons on board during transit and the worst weather conditions likely to be encountered in the intended area of operation.

22.3 Safety Harnesses

22.3.1 A vessel should be provided with at least 2 safety harnesses and additional safety harnesses as necessary for all persons who may be required to work on deck.

22.3.2 Efficient means for securing the life lines of safety harnesses should be provided on exposed decks, and grabrails provided on the sides and ends of a deckhouse.

22.3.3 Fastening points for the attachment of safety harness life lines should be arranged having regard to the likely need for work on or above deck. In general, securing points should be provided in the following positions :-

- .1 close to a companionway; and
- .2 on both sides of a cockpit.

22.3.4 When guard rails or wires are not otherwise provided, jackstays (which may be fixed or portable) secured to strong points, should be provided on each side of the vessel to enable crew members to traverse the length of the weather deck in bad weather.

22.4 Surface of Working Decks

22.4.1 The surface of a working deck should be non-slip.

22.4.2 Acceptable surfaces are: chequered plate; unpainted wood; a non-skid pattern moulded into fibre reinforced plastic (FRP); non-slip deck paint; or an efficient non-slip covering.

22.4.3 Particular attention should be paid to the surface finish of a hatch cover when it is fitted on a working deck.

22.4.4 In an inflatable boat or rigid inflatable boat the upper surface of the inflated buoyancy tube should be provided with a non-slip finish.

22.5 Retrieval of Persons from the Water

22.5.1 Reference should be made to Annex 3 - Life-Saving Appliances, note 6, for principal requirements for equipment and fittings to be provided for the retrieval of persons from the water.

22.5.2 A vessel which is accepted as being able to act as its own rescue boat should demonstrate the practical effectiveness of the retrieval arrangements provided onboard. Demonstration of effectiveness should be by functional tests carried out under controlled safe conditions to the satisfaction of the Certifying Authority.

22.5.3 When a vessel is manned normally by a helmsman and one crew, the demonstration required in 22.5.2 should include retrieval of the crew member from the water. (In this demonstration, the crew member can be assumed to be conscious.)

22.6 Personal Clothing

The owner/managing agent responsible for the safe operation of the vessel should ensure that the persons onboard are properly attired for the voyage to be undertaken. Attention is drawn to the following:-

- 22.6.1 Each person on board a vessel should have protective clothing appropriate to the prevailing air and sea temperatures.
- 22.6.2 On a vessel which operates in waters of mean sea surface temperature of 10°C or less, each person on board should have either an approved immersion suit, a dry suit or other efficient garment to reduce the likelihood of hypothermia should the wearer enter the sea.

22.7 Noise

Attention is drawn to the second edition of the "Code of practice for noise levels in ships" (Noise Code) published by HMSO in 1990 and Merchant Shipping Notice No. M.1415 - Code of practice for noise levels in ships.

- 22.7.1 New vessels covered by this Code should meet the recommendations of the Noise Code so far as is reasonable and practicable.
- 22.7.2 Existing vessels should be considered with particular regard to the recommendations of the Noise Code for protection of the crew from noise levels which may give rise to noise-induced hearing loss.
- 22.7.3 The Noise Code recognises that the scope for strict application of recommended noise levels on small vessels is usually limited and deals with the means of protecting the seafarer from the risk of noise-induced hearing loss under conditions where, at the present time, it is not technically feasible to limit the noise to a level which is not potentially harmful. Factors which are taken into account include voyages of short duration and vessels without sleeping accommodation which are crewed on a shift basis.
- 22.7.4 For safe navigation, so that sound signals and VHF communications can be heard, it is desirable that a noise level of 65dB(A) at the navigating position is not exceeded.
- 22.7.5 For machinery spaces, workshops and stores which are manned either continuously or for lengthy periods, the recommended limits are 90dB(A) for machinery spaces and 85dB(A) for workshops and stores.

For machinery spaces which are not intended to be continuously manned or are attended for short periods only, the recommended limits are 110dB(A).

The limits have been set from hearing damage risk considerations and the use of suitable ear protectors.

22.7.6 To indicate the need to wear ear protectors, BS 5378 - Safety signs, sign with symbol and supplementary warning notice should be displayed at all entrances to spaces in which the noise level exceeds 85dB(A).

22.7.7 Annex 10 is extracts from the Noise Code which indicate the maximum daily noise doses for unprotected ears, based on dB(A) sound energy received and examples of noise levels in different locations which may enable personnel to gauge potentially harmful noise exposure.

MEDICAL STORES

A vessel should carry medical stores in accordance with Merchant Shipping Notice No. M.1707.

TENDERS (DINGHIES)

When a ship's tender is provided (towed or carried by a vessel) for use in transferring persons between the vessel and the nearby shore, the following apply:-

- .1 An inflatable tender is not required to meet the requirements for inflatable boats or rigid inflatable boats in Section 4.5.
- .2 A tender should be clearly marked with the number of people of mass 75 kg that it can safely carry and with the name of the parent vessel.
- .3 A tender should be fit for the purpose, regularly inspected by the owner/managing agent and maintained in a safe condition.

25 REQUIREMENTS SPECIFIC TO USE OF VESSEL

25.1 Vessel Engaged as a Pilot Boat

25.1.1 General

A vessel engaged as pilot boat may be recognised as either a dedicated pilot boat which is certificated as a pilot boat or a certificated workboat which is engaged as a pilot boat from time to time.

A pilot boat should be certificated, even if it does not operate at sea.

The requirements of the Code apply generally to all vessels. Requirements for a pilot boat are, in certain matters of safety, either additional or alternative to the requirements of the Code. Section 25.1 contains the requirements for a pilot boat.

Under the Merchant Shipping (Small Workboats and Pilot Boats) Regulations 1998 the Secretary of State may exempt any pilot boat from any or all of the provisions of the part of the regulations dealing with pilot boats. In granting an exemption, the Secretary of State may do so on such terms (if any) as he may specify if he is satisfied that compliance with such provision is either impracticable or unreasonable in the case of a pilot boat and may, subject to giving reasonable notice, alter or cancel any such exemption. Applications for exemption should be submitted through the Certifying Authority for a pilot boat to the Maritime and Coastguard Agency for consideration. Only the Maritime and Coastguard Agency is empowered to grant exemptions on behalf of the Secretary of State.

Section 2 gives the definitions:

"Pilot boat" means a boat employed or intended to be employed in pilotage services; and "Dedicated pilot boat" means a pilot boat which is primarily employed in pilotage services and other occasional services undertaken such as the carriage of personnel, mail and/or small quantities of stores to or from vessels in the pilotage district;

25.1.2 Dedicated pilot boat

A dedicated pilot boat should comply with the following requirements. The requirements refer to the appropriate Sections of the Code. An existing dedicated pilot boat should comply with all the requirements before its current certificate is renewed.

- *5.2.1.3 The normal means of access from the open deck to accommodation space provided for the use of pilots should not be a forward facing weathertight door;
- *5.4 Pilot boarding activities should be visible from the pilot boat helmsman's position. Visibility should be adequate in both the vertical and horizontal planes;
- 5.4.9.3 For a vessel which is expected to operate in severe weather (for its size), the requirement to provide efficient storm shutters for all front and side facing wheelhouse windows can be moderated on the basis of recorded safe operating experience of pilot boats in their particular area of operation;
- *7.3 A pilot boat should not be fitted with a petrol engine;
- *11 A seagoing pilot boat should carry an approved stability information booklet which meets the requirements of 11.1.2 if it is a new pilot boat or if it began service as a pilot boat on or after 2 April 1991 or if it is neither of the previous alternatives but has undergone significant (to stability) modifications.

A non-seagoing pilot boat should undergo a heeling test in the fully loaded condition and be demonstrated to meet the requirements of 11.1.3 if it is a new pilot boat or if it began service as a pilot boat on or after 2 April 1991 or if it is neither of the previous alternatives but has undergone significant (to stability) modifications.

The standard of stability of a pilot boat in pilotage service before 2 April 1991 and which is still used in the same service may be accepted by the Certifying Authority provided the competent harbour authority, owner(s) or person in charge of the pilot boat confirms that it has not undergone any significant (to stability) modifications and there have been no adverse reports during its service which indicate that the standard of stability was not adequate for the service of the pilot boat;
- 12 A dedicated pilot boat need not be marked with a freeboard mark;
- *13 Annex 3 requirements applied to pilot boats include the provision of an immersion suit for each person onboard (note 5.2).

4 parachute white illuminating flares should be provided for emergency use in rescues at night (the use of pyrotechnics must be considered having regard to the environment in which the pilot

boat is being operated e.g. where a flammable atmosphere could be present);

6 red rocket parachute flares should be provided;

2 line throwing appliances (half a set) should be provided;

18.2.2 Water depth measuring equipment is required only on dedicated pilot boats of 12 metres in length and over. A hand lead line should satisfy this requirement ;

19.1.1 Pilot boats of 12 metres in length and over need to carry at least the nautical publications required for a vessel of less than 12 metres in length (19.1.2);

*19.5 A searchlight should be provided which is permanently mounted so as to be capable of illuminating the ships side in way of the pilot ladder or the sea area around the boat;

20 When the Code requirements for anchors and cables are considered excessive, the competent harbour authority should seek the approval of the Certifying Authority for alternative provisions appropriate to the size of vessel and its area of operation;

*21 Seating should be provided for all members of the crew and the pilots to be carried. Seat belts should be provided for the safety of seated passengers and crew;

*22 For the safe access of personnel, the minimum width of side deck inboard of the bulwark or rails or toe-rail on new vessels should be 400mm but regard should be given to the height and shape of adjacent superstructure or deckhouse. (The width of side deck on existing vessels should be accepted on the basis of a history of safe operation.) Side decks should be illuminated;

*22.3 An efficient uninterrupted/continuous safety rail system for clip-on safety harnesses should be provided. The system should allow the harness traveller to move freely and without adjustment over the full length of the safety rail. The rail system, its attachment to the vessel structure and the clip-on safety harnesses should be designed, constructed, installed, tested and maintained to appropriate personal protective equipment standards;

*22.5 Rescue retrieval equipment should be provided as follows:-

- .1 transom steps and/or ladder or equivalent side ladder or scrambling net.
- .2 at least 2 buoyant lifelines of not less than 18 metres in length. Each of the lifelines should have a quoit of appropriate weight secured to one end.
- .3 efficient mechanical means for the retrieval of any person who falls overboard and means to bring the person in the water to the retrieval point. Where practicable, the arrangement should enable the person to be retrieved in the horizontal position, in order to reduce the risk of heart failure associated with hypothermia.

The quality of materials, design and workmanship of construction of the mechanical means of retrieval should ensure that it can be rapidly deployed and will operate efficiently in an emergency. The efficiency of the equipment should be ensured by regular maintenance and testing. (Functional tests are detailed in .6 below.)

- .4 all ladders and outside fittings such as overside steps or booms etc. should be of suitable materials, design and workmanship. Such equipment should be rigged onboard and inspected at regular intervals.
- .5 arrangements should be provided to protect a person in the water from injury by the propeller(s). When it is impractical to fit a guard to the propeller(s), consideration should be given to alternative measures such as the fitting of a drop down gate/ladder to screen the propeller(s) or operational procedures which include the means to stop the propeller immediately. (The arrangements should be approved by the Certifying Authority for the pilot boat.)
- .6 rescue retrieval equipment should be demonstrated by functional tests carried out under controlled safe conditions, to the satisfaction of the Certifying Authority. The functional tests should include a simulation of the pilot boat in the minimum manned condition with the coxswain and deckhand onboard and the event when the deckhand falls overboard and is recovered. (In this particular simulation, the deckhand can be assumed to be conscious.)

It is recommended that competent harbour authorities (or pilotage provider, in the absence of a competent harbour authority) require manoverboard retrieval exercises to be conducted by each pilot boat crew every 6 months;

23 In addition to the medical stores required by Section 23, a compact stretcher should be carried on a new pilot vessel and, when practicable, on an existing pilot vessel;

*26 Subject to Merchant Shipping Notice No. M.1473 - Manning of Pilot Boats:-

A pilot boat should be manned by a minimum of 2 adult persons, namely a coxswain, and a deck hand who can assist the pilot when boarding or landing. The competent harbour authority or owner(s)/managing agent(s) of the pilot boat should be satisfied as to the competence and fitness for duty of these persons; and

All pilot boat crew members should:

- (a) hold a Department of Environment, Transport and Regions First Aid Certificate; or
- (b) hold a First Aid Certificate issued in accordance with regulation 3(2) of the Health and Safety (First Aid) Regulations 1981 (SI 1981 No.917); or
- (c) have received training in emergency first aid in accordance with regulation 3(2) of the Health and Safety (First Aid) Regulations 1981 (SI 1981 No.917) as described in paragraphs 28 and 29 under regulation 3(2) of the Health and Safety Commission publication "First Aid at Work - Approved Code of Practice" (ISBN 0 11 885536 0);

27.4.2.1 A dedicated pilot boat should be issued with a pilot boat certificate. (See Annex 14.)

25.1.3 A workboat engaged as a pilot boat

25.1.3.1 A workboat engaged as a pilot boat from time to time should comply with the Code as it applies to its duties as a workboat and, in addition, comply with the requirements for a dedicated pilot boat which are marked with * in 25.1.2.

Such a vessel should be in possession of a workboat certificate which carries a PILOT BOAT ENDORSEMENT.

25.1.3.2 An existing vessel which is currently certificated to be a relief pilot boat or a pilot boat used at a small port or a dual purpose pilot boat should comply with all the requirements of 25.1.3.1 before its current certificate is renewed.

In the event that the safety rail system required by *22.3 is considered to be inappropriate because of other measures provided to prevent persons on deck from falling overboard (e.g. extent and height of bulwarks or rails), the Certifying Authority should be satisfied that the provisions for the safe movement of pilots and others persons on deck during transfers are adequate.

25.2 Vessel Engaged in Towing

25.2.1 General

25.2.1.1 Reference should be made to Section 11.5 for stability of vessels engaged in towing and to Annex 8 - Lights, Shapes and Sound Signals, for requirements for towing and towed vessels.

25.2.1.2 An existing vessel which is used for towing and has a proven history of safe operation should be considered on the basis of the safe history and conditions which have been applied to ensure the safety of the vessel and the persons onboard.

25.2.1.3 For seagoing tows the owner/managing agent should consider the duration of the tow with regard to responsibility for safe manning requirements in accordance with Annex 11, paragraph 7.

25.2.1.4 The owner/managing agent should ensure that the skipper is aware and has copies onboard the vessel of relevant Merchant Shipping Notices which give guidance on safety of vessels engaged in towing.

Particular attention is drawn to the guidance provided currently in Merchant Shipping Notices:

M.930 Interaction between ships;

M.1406 Safety of towed ships and other floating objects; and

M.1531 Safety of tugs whilst towing.

Due regard should be given to other relevant Merchant Shipping Marine Guidance Notices (MGN) which may be issued from time to time, which give guidance on the safety of vessels which tow.

25.2.2 Towing arrangements

- 25.2.2.1 The design of towing gear should minimise the overturning moment due to the lead of the towline (see Section 11.5 with regard to stability).
- 25.2.2.2 The towing hook or towline should have a positive means of release which can be relied upon to function correctly under all operating conditions.
- 25.2.2.3 The towing hook (or equivalent fitting) and the supporting structure should be strong enough to withstand loads imposed during towing operations. The towing line should be the weak link in the towing arrangement.
- 25.2.2.4 In a new vessel the release mechanism should be controlled from the wheelhouse, at the aft control position (if provided) and any other conning position and at the hook itself. The local control at the hook should be of the direct mechanical type capable of independent operation.
- In an existing vessel the arrangements should be the same as required for a new vessel so far as practicable.
- 25.2.2.5 Towing arrangements should be maintained to ensure that they are in an efficient working condition.

25.2.3 Weathertight integrity

- 25.2.3.1 Doorways in superstructures, deckhouses and exposed machinery casings situated on the weather deck and which enclose accesses to spaces below deck should be provided with efficient weathertight doors. Weathertight doors should be secured in the closed position when the vessel is towing and the doors should be marked clearly to this effect.
- 25.2.3.2 Machinery air intakes and machinery space ventilators which must be kept open during towing operations should be served by means of high coaming ventilators as protection from downflooding.
- 25.2.3.3 Generally, airpipes and ventilators should be kept as far inboard as possible and be fitted with automatic means of closure when downflooding to the compartments served would endanger the safety of the vessel.

25.2.4 The towed vessel or floating object

A small vessel, pontoon, barge or floating object which is towed to sea from a place in the UK should be surveyed and issued with an appropriate load line certificate for the towed voyage. Certification for non-self-propelled vessels which make voyages under tow is permitted in accordance with 25.5.

25.3 Cargo Carrying

25.3.1 When a vessel is engaged in carrying cargo all such cargo should be stowed and secured in a manner which will not adversely affect the safe operation of the vessel.

25.3.2 Particular attention should be paid to the means for securing the cargo and the strength of securing points, the free drainage of water from cargo stowed on open deck, safe access in way of cargo stows and unobstructed visibility from the wheelhouse.

25.3.3 Cargo hatchways to dry cargo holds or spaces should be of efficient weathertight construction.

23.3.3.1 In general, a cargo hatch coaming should be not less than 760mm in height. Hatch covers should be designed to withstand (without permanent deformation) a hydrostatic load of not less than 1.5 tonnes/metre² overall and be fitted with efficient means to be closed and secured weathertight to the coaming. In any case, the coaming and hatch cover should be sufficiently strong to withstand the hydrostatic loading and/or the loading due to cargo stowed on the hatch cover, whichever loading is limiting.

23.3.3.2 Proposals for a cargo hatchway with a reduced coaming height or a flush hatch should be subject to special consideration by the Certifying Authority and may be approved when the safety of the vessel is judged to be at least equivalent to 25.3.3.1.

25.4 Vessel Fitted with a Deck Crane or other Lifting Device

25.4.1 Reference should be made to Section 11.4 for requirements for safety standards for vessel stability during lifting operations.

25.4.2 Generally, a vessel fitted with a deck crane or other lifting device which will be used when the vessel is offshore should be a decked vessel with a watertight weather deck in accordance with 4.1.1 and 4.3.1.1.

Agreement should be obtained from the Maritime and Coastguard Agency any proposal to fit a deck crane or other lifting device on a vessel which is not a decked vessel.

25.4.3 The vessel's structure, the crane or other lifting device and the supporting structure should be of sufficient strength to withstand the loads that will be imposed when operating at its maximum load moment.

25.4.4 Load tests to verify the safe operation of the crane or other lifting device, its foundation and supporting substructures should be carried out to the satisfaction of the Certifying Authority. Tests should be conducted in accordance with a recognised standard for the installation.

Typically, the crane or other lifting device should be subjected to a 25% overload test. (In special circumstances a reduced overload may have to be accepted but in no case should this be less than 10%.) During the overload test, the hoist, slew and luff performance should be tested at low speed, as appropriate. Tests for a variable load-radius type of crane or other lifting device should be extended to correspond to its rated performance.

Attention is drawn to the requirements of BS 7121:Part 2:1991 - Code of practice for safe use of cranes; Part 2. Inspection, testing and examination. Paragraph 17 - Cranes on water borne craft, has particular relevance to vessels certificated in accordance with this Code.

25.4.5 An inclinometer (pendulum) should be provided onboard for guidance to the crane or lifting device operator when controlling the lifting items of unknown weight.

25.4.6 A prominent clear notice should be posted on or near the crane or lifting device and contain the following information and instructions :-

- .1 the maximum permitted load and outreach which satisfy the requirements of 11.4.2, or the safe working load (SWL), whichever is the lesser (operating performance data for a crane or other lifting device of variable load-radius type should be included as appropriate.);
- .2 details of all openings leading below deck which should be secured weathertight; and
- .3 instructions for all personnel to be above deck before lifting operations commence.

25.4.7 A lifting system which incorporates counterbalance weight(s) should be specially considered by the Maritime and Coastguard Agency.

25.4.8 The Certifying Authority should be satisfied that the safety of the vessel is not endangered by lifting operations. Means should be provided for the efficient securing of cargo and loose equipment onboard during lifting operations. Instructions on safety procedures to be followed by the skipper should be provided to the satisfaction of the Certifying Authority.

25.5 Non-Self-Propelled Vessel

25.5.1 General

25.5.1.1 It is permissible for a Workboat Certificate to be issued to cover the transit voyages under tow of an unmanned non-self-propelled vessel or floating object of defined rigid form. The valid life of the certificate should be decided by the Certifying Authority but in no case should it exceed 5 years.

- 25.5.1.2 It is permissible for a Workboat Certificate to be issued to cover the safety of a non-self-propelled vessel of defined rigid form which is a working platform for equipment and/or power producing plant. The vessel should be assessed for compliance with the parts of the Code which are appropriate to its commercial operation.
- 25.5.1.3 A vessel of defined rigid form includes a vessel which comprises an assembly of separate units held together by an efficient engineered joining system appropriate to the mode of operation of the vessel.
- 25.5.1.4 A vessel which has the capability of a jack-up to operate clear of the surface of the water should be equipped and certificated to meet the requirements of the Health and Safety Executive, when it is jacked up.
- 25.5.1.5 A small non-self-propelled vessel which is not covered by 25.5.1.1, 25.5.1.2 or 25.5.1.3 should be referred to the Maritime and Coastguard Agency for consideration of safety standards and certification to be applied.
- 25.5.1.6 The safety of towed ships or other floating objects is covered by Merchant Shipping Notice No. M.1406 - Safety of towed ships and other floating objects, and for any tow the content of this Notice should be brought to the attention of those responsible for the safety of the towing operation.

25.5.2 Stability

When the stability standards of Section 11 are not appropriate for assessment of a particular small non-self-propelled vessel the case should be referred to the Maritime and Coastguard Agency for consideration of stability standards to be applied.

25.5.3 Freeboard

- 25.5.3.1 Generally, freeboard should be assigned in accordance with the Merchant Shipping (Load Line) Regulations 1998.

An existing non-self-propelled vessel with a valid United Kingdom Load Line Exemption Certificate but having an assigned freeboard less than that required by the Merchant Shipping (Load Line) Regulations 1998 should be accepted for a Workboat Certificate under the same conditions given on the Exemption Certificate.

Load line marking should be applied in accordance with 12.3 (but see 25.5.3.3).

- 25.5.3.2 An unmanned pontoon barge on which the freeboard deck is penetrated only by small access openings which are closed by gasketed watertight covers should

have freeboard determined in accordance with the Merchant Shipping (Load Line) Regulations 1998 as if it was a Type "A" ship and omitting any correction for minimum bow height. At the discretion of the Certifying Authority, having due regard for safe voyages of the unmanned barge under conditions which should be explicitly recorded on the Workboat Certificate, the freeboard thus determined may be reduced by up to 25%.

25.5.3.3 No requirement is made for the provision of draught marks. In order that the towing master can readily recognise change in the condition of the tow, the towed vessel should be marked at the forward end with one or more white bars 2000mm in length and 150mm high (or alternative marking which is clearly visible from the towing vessel) to the satisfaction of the Certifying Authority.

26 MANNING

- 26.1 The operational manning of Code certificated vessels should be in accordance with Annex 11, except that pilot boat manning requirements are given in 25.1.2.
- 26.2 Owner(s)/managing agent(s) of vessels should ensure that skippers, crew and operators of winches and lifting gear are familiar with the stability issues detailed in paragraph 6 of Annex 11 as applied to the type of vessel being operated and the nature of the duties being undertaken.
- 26.3 The possession of a Certificate of Competency or Service should not, on its own, be regarded as evidence of ability to serve in a particular rank on a specific vessel. The owner(s)/managing agent(s) must ensure that there are sufficient trained personnel on board to work the vessel having due regard for the nature and duration of the voyage.
- 26.4 The skipper of a vessel should ensure that each person onboard is briefed on safety in accordance with the requirements given in Annex 12.
- 26.5 When a vessel is to be operated single handed, having been considered with respect to Section 3.7, Annex 2 and paragraphs 2.2.1 and 2.2.6 of Annex 11, the owner(s)/managing agent(s) should be satisfied that such operations can be carried out safely.
- The certificate issued for a vessel which the Certifying Authority is satisfied can be operated single handed should be endorsed "SUITABLE FOR SINGLE HANDED OPERATIONS". Unless the certificate for a vessel carries this endorsement, the vessel should not be operated by one person.
- (Typically, a Certifying Authority may determine that a vessel cannot be safely operated by one person because of its size and/or arrangement.)
- 26.6 For group operations in protected waters or on a restricted service, single handed operations may be carried out and the qualifications of the skipper may be considered in relation to the operating area, type of work and working conditions (see paragraph 2.2 of Annex 2).

27 COMPLIANCE PROCEDURES, CERTIFICATION, EXAMINATION AND MAINTENANCE

27.1 Definitions

The Certifying Authority should decide the extent of the examination based on the type, age and history of the vessel.

Definitions (copied from Section 2) relevant to an examination are:-

"Authorised person" means a person who by reason of relevant professional qualifications, practical experience or expertise is authorised by the Certifying Authority chosen by the owner/managing agent from those listed in the Code to carry out examinations required under Section 27 of the Code.

"Compliance examination" means an examination of the vessel, its machinery, fittings and equipment, by an authorised person, to ascertain that the vessel complies with the requirements of the Code. At least part of the examination should be conducted when the vessel is out of the water.

"Annual examination" means a general or partial examination of the vessel, its machinery, fittings and equipment, as far as can readily be seen, to ascertain that it has been satisfactorily maintained as required by the Code and that the arrangements, fittings and equipment provided are as documented in the appropriate form(s). The hull of the vessel should be examined out of the water at intervals not exceeding 3 years. The Certifying Authority may stipulate a lesser interval in consideration of hull construction material or the age or the type and service of the vessel.

Forms used by the Certifying Authorities are typically:-

For workboats:-

- Application for survey (or examination);
- Surveys for freeboard (freeboard computation);
- Compliance examination and declaration;
- Details of freeboards to be marked.

For pilot boats:-

- Application for survey (or examination);
- Record of particulars of a pilot boat;
- Declaration of survey.

27.2 Requirements for Vessels to be Examined and Certificated

27.2.1 The owner/managing agent of a vessel to be operated under the Code, should:-

- .1 choose an authorised Certifying Authority and contact them to obtain a copy of the appropriate application form for examination/survey;
- .2 complete the form and return it to the Certifying Authority with an advance of fees (when requested);
- .3 arrange with the Certifying Authority for the vessel to be examined by an authorised person and documented in the appropriate report form(s) for a Compliance Examination (see 27.3 for workboats and 27.4 for pilot boats); and
- .4 be in receipt of a valid certificate for the vessel prior to it entering into service. (The form of the certificate is given in Annex 13.)

Notes: Attention is drawn to 11.2.3.3 (existing vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing not more than 1000kg) which requires conditions which apply to a vessel permitted to move between operating sites to be recorded on the certificate.

Attention is drawn to 26.5 which requires that the certificate for a vessel which has been accepted for single handed operations should be endorsed "SUITABLE FOR SINGLE HANDED OPERATIONS". A vessel should not operate single handed if its certificate is not endorsed.

27.3 Examination and Certification of Workboats

27.3.1 Issue of a workboat certificate

27.3.1.1 The owner/managing agent should arrange with the Certifying Authority for a compliance examination to be carried out by an authorised person. The arrangements, fittings and equipment provided on the vessel are to be documented on the appropriate report form(s). Upon satisfactory completion and documentation of the compliance examination a copy of the signed report form(s) should be forwarded to the Certifying Authority.

27.3.1.2 For vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing more than 1000kg and vessels of 15 metres in length and over, before a certificate is issued the owner/managing agent should be in possession of an approved stability information booklet for the vessel (see

11.6.2) and approved damage stability information (see 11.6.3, when it is applicable).

- 27.3.1.3 For vessels of less than 15 metres in length which carry cargo or a combination of passengers and cargo weighing not more than 1000kg or neither passengers nor cargo and are not fitted with lifting devices, before a certificate is issued the Certifying Authority should approve the practical stability tests (see 11.6.1).
- 27.3.1.4 For vessels operating in protected waters and/or a restricted service for which alternative safety standards have been agreed in accordance with 3.7 and Annex 2, the procedures leading to issue of a certificate should be included in the agreement with the Regional Chief Surveyor of the Maritime and Coastguard Agency.
- 27.3.1.5 Upon satisfactory review of the documented arrangements, fittings and equipment provided in compliance with the Code, also the required declarations in the completed report form(s), approval of damage and/or intact stability as appropriate and fee payments, the Certifying Authority should issue a full term certificate.
- 27.3.1.6 A certificate should be valid for not more than five years from the date of examination of the vessel out of the water by the authorised person.

27.3.2 Compliance examination for renewal of a workboat certificate

- 27.3.2.1 The owner/managing agent should arrange for a compliance examination to be carried out by an authorised person from the chosen Certifying Authority. At this examination the vessel should be examined both in and out of the water. Upon satisfactory completion and verification that the arrangements, fittings and equipment documented in the report form(s) remain in compliance with the Code and that the vessel and its machinery are in a sound and well maintained condition, the certificate in force should be endorsed to indicate a 3 month extension and a copy of the report recommending the renewal of the certificate should be sent to the Certifying Authority.
- 27.3.2.2 Upon satisfactory review of the arrangements, fittings and equipment documented in the report form(s) as being in compliance with the Code, the Certifying Authority should renew the vessel's certificate.

27.3.3 Annual examination of a workboat

The owner/managing agent should arrange for an annual examination of a vessel to be carried out by an authorised person within 3 months either side of the anniversary date of the initial/renewal examination but the period between annual examinations should not exceed 15 months.

Except when an underwater examination is due, this examination may be carried out whilst the vessel is in the water. (The hull of a vessel should be examined out of the water at intervals not exceeding 3 years.)

On satisfactory completion of the annual examination, the authorised person should enter details of the examination on the report form(s) and report the results of the examination to the Certifying Authority.

27.3.4 Existing vessels with load line certificates

When an existing vessel has a valid load line or load line exemption certificate, it may continue to operate under the conditions applicable to the certificate in force. Upon expiry of the certificate in force, the owner/managing agent may choose to renew the previous certificate or apply to a Certifying Authority for issue of a workboat certificate under the Code.

27.4 Examination and Certification of Pilot Boats

27.4.1 Issue of a pilot boat certificate or workboat certificate with pilot boat endorsement

27.4.1.1 The competent harbour authority or the owner/managing agent should arrange for a dedicated pilot boat to be examined by an authorised person at intervals not exceeding 4 years.

27.4.1.2 An application for the examination of a pilot boat should be made by the competent harbour authority or the owner/managing agent of the boat to the Certifying Authority.

27.4.1.3 On receipt of the application, the Certifying Authority should arrange for an authorised person to examine the vessel in the manner prescribed in the Code and satisfy himself that:-

- .1 the form of construction, machinery installation and safety equipment is consistent with the standards specified in the Code; and
- .2 the vessel is in all respects satisfactory for the service for which it is intended, having regard to the period for which the pilot boat certificate or workboat certificate with pilot boat endorsement is to be issued.

27.4.1.4 Propeller shaft(s) (other than shaft(s) running in oil) should be drawn for examination at the initial survey and, thereafter, at intervals not exceeding 4 years.

Propeller shafts running in oil should be withdrawn for examination at intervals not exceeding 10 years, provided that an intermediate examination shows that wear has been insignificant.

The authorised person should record all examinations on the form of record of particulars of a pilot boat or form of compliance examination and declaration of a workboat, as appropriate.

27.4.1.5 When survey repairs, replacements or modifications are undertaken, the authorised person should make records of them on the form of record of particulars of a pilot boat or form of compliance examination and declaration of a workboat, as appropriate.

27.4.1.6 The authorised person, if satisfied from the examination that it is proper to do so, should forward to the Certifying Authority the completed forms containing such particulars of the vessel and its equipment as are required to enable the Certifying Authority to issue a pilot boat certificate or make a pilot boat endorsement on a workboat certificate, together with a certified copy or copies of certificates issued in respect of the vessel.

27.4.2 Pilot boat certificate and pilot boat endorsement of a workboat certificate

27.4.2.1 A pilot boat certificate for a dedicated pilot boat should contain the information shown in Annex 14 and, unless the vessel, its machinery or safety equipment is found to be deficient, should have a period of validity not exceeding 4 years from the date of examination of the vessel out of the water by the authorised person.

27.4.2.2 The pilot boat endorsement of a workboat certificate should be in the form shown in Annex 13. A workboat certificate should have a period of validity not exceeding 5 years (see 27.3.1.6), unless the vessel, its machinery or safety equipment should be found to be deficient. A workboat should be examined annually (see 27.3.3).

27.4.2.3 The pilot boat certificate or workboat certificate with pilot boat endorsement should be displayed in a prominent position within the vessel, and a certified copy of the certificate should be retained by the competent harbour authority, and, where appropriate, by the owner/managing agent of the boat.

27.4.3 Intermediate examination of a dedicated pilot boat

27.4.3.1 The competent harbour authority or the owner/managing agent of a dedicated pilot boat should arrange for the boat to undergo an intermediate examination, which should take place not more than 3 months before nor more than 3 months after the halfway date of the period of validity of the pilot boat certificate.

27.4.3.2 The authorised person should examine the boat in the manner prescribed for an annual examination and be satisfied that:-

- .1 such parts of the vessel, its machinery and equipment as are specified in the Code and are subject to the survey, remain in good working condition; and
- .2 no major alterations have been made to the vessel, its machinery or equipment, to which the pilot boat certificate relates, without the approval of the Maritime and Coastguard Agency.

27.4.3.3 On completion of a satisfactory intermediate examination, the authorised person should endorse the pilot boat certificate accordingly.

27.4.4 Procedure if a pilot boat, its machinery or safety equipment is deficient

27.4.4.1 When an authorised person determines that the condition of a pilot boat, its machinery or equipment does not correspond substantially with the requirements in the Code or is such that the vessel is not fit for service, he should advise the competent harbour authority and, where appropriate, the owner/managing agent of the boat of the corrective action which is required.

27.4.4.2 If a pilot boat is not fit for service, the authorised person should notify the Maritime and Coastguard Agency and if any corrective action deemed to be required is not taken within a specified period, the Maritime and Coastguard Agency will suspend the validity of the certificate for the pilot boat, and notify the competent harbour authority in writing. The authorised person should notify the skipper of the vessel and, where appropriate, the owner/managing agent of the vessel.

27.4.4.3 The skipper of the vessel and, where appropriate, the owner/managing agent of the vessel should deliver up to the authorised person, respectively, the certificate and certified copy of the certificate. The competent harbour authority should deliver up the certified copy of the certificate to the Maritime and Coastguard Agency.

27.4.4.4 When satisfied that corrective action has been taken, the authorised person should notify the Maritime and Coastguard Agency who should restore the validity of the certificate, notify the competent harbour authority and return the certified copy of the certificate to that authority. The authorised person should return the certificate and certified copy of the certificate, respectively, to the skipper of the vessel and, where appropriate, the owner/managing agent of the vessel.

27.4.5 Exemptions for pilot boats (see 25.1.1)

27.4.5.1 The Maritime and Coastguard Agency may exempt a pilot boat from all or any of the requirements of the Code as may be specified in the exemption on such terms (if any) as may be specified if the Maritime and Coastguard Agency is

satisfied that compliance with such requirements is either impracticable or unreasonable in the case of that pilot boat and may, subject to giving reasonable notice, alter or cancel any such exemption.

27.4.6 Existing pilot boats with pilot boat certificates

When an existing pilot boat has a valid pilot boat certificate issued under the Merchant Shipping (Pilot Boat) Regulations 1991, SI 1991 No.65, it may continue to operate under the conditions applicable to the certificate in force. Upon expiry of the certificate in force, the competent harbour authority or owner/managing agent should apply for the corresponding certificate to be renewed in accordance with the requirements of this Code.

27.5 Appeal Against the Findings of an Examination

If an owner/managing agent or competent harbour authority is dissatisfied with the findings of an examination and agreement can not be reached with the authorised person who carried out the examination, the owner/managing agent or competent harbour authority may appeal to the Certifying Authority to review the findings. At this review, the owner/managing agent or competent harbour authority may call a representative or professional adviser to give opinions in support of the argument against the findings of the examination.

Should the above procedures fail to resolve the disagreement, the owner/managing agent or competent harbour authority may refer the disagreement to the Director of Standards in the Maritime and Coastguard Agency for arbitration.

27.6 Maintaining and Operating the Vessel

27.6.1 The Certifying Authority may examine a certificated vessel at any time.

27.6.2 It is the responsibility of the owner/managing agent to ensure that at all times a vessel is maintained and operated in accordance with the requirements of the Code, the arrangements as documented in the report form(s) and any conditions stated on the vessel's certificate. If for any reason the vessel does not continue to comply with any of these requirements, the owner/managing agent should notify the Certifying Authority immediately. (Also see 27.7.3.)

27.6.3 If a vessel suffers a collision, grounding, fire or other event which causes damage, the owner/managing agent should notify the Certifying Authority immediately.

In addition, the owner/managing agent has a statutory requirement to report accidents. The statutory requirements are given in the Merchant Shipping

(Accident Reporting and Investigation) Regulations 1994, SI 1994 No.2013. Merchant Shipping Notice No. M.1584 - Accident reporting and investigation, explains the Regulations and the requirement to report accidents to the Marine Accident Investigation Branch of the Department of Environment, Transport and the Regions.

27.6.4 The nature and extent of repairs should be subject to the approval of the Certifying Authority. The owner/managing agent should seek approval from the Certifying Authority prior to implementing any change or modification which is covered by the requirements of the Code.

27.7 Validity and Cancellation of Certificates

27.7.1 The validity of a certificate issued under the Code is dependent upon a vessel being maintained, equipped and operated in accordance with the documented arrangements contained in the appropriate report form(s). Proposals to change any of the arrangements should therefore be agreed in writing with the Certifying Authority before a change is implemented. Copies of the written agreement detailing change(s) should be appended to the report form(s), which should be retained on board the vessel.

27.7.2 When a vessel is found not to have been maintained or equipped or operated in accordance with the arrangements documented in the appropriate report form(s), the certificate may be cancelled by the Certifying Authority which issued the certificate.

27.7.3 When a vessel is sold, the certificate issued by the Certifying Authority is cancelled automatically and the selling owner/managing agent should return the certificate to the Certifying Authority for formal cancellation and records. A new certificate may be issued to the new owner on receipt by the Certifying Authority of the appropriate application form completed by the new owner. The Certifying Authority should decide the extent of any examination, if any, of the vessel which may be required before a new certificate is issued.

27.7.4 When a vessel has had its certificate cancelled, the Certifying Authority should report the circumstances to the Maritime and Coastguard Agency for action to be taken as deemed necessary.

CLEAN SEAS

A vessel complying with the Code should meet international, national, regional and local requirements for the prevention of marine pollution which are applicable to the area in which the vessel is operating.

Responsibility for the vessel to be properly equipped and maintained to meet the requirements prevailing, rests with the owner/managing agent.

It is also the responsibility of the owner/managing agent to ensure that the skipper receives up-to-date and adequate information on prevention of pollution in the area in which the vessel is to operate.

Requirements for preventing pollution of the sea:-

Sewage When the direct overboard discharge of sewage is prohibited by administrations/authorities in an area of operation, the provision of "holding tanks" of sufficient capacity to store waste for discharge to shore facilities may be needed for a vessel to comply.

Garbage The disposal of garbage into the sea is prohibited by the Merchant Shipping (Prevention of Pollution by Garbage) Regulations 1988, SI 1988 No.2292. Arrangements for the retention of garbage on board and for discharge to shore reception facilities should be provided. Arrangements should be varied as necessary to comply with special requirements which may be applied by administrations/authorities in the area in which a vessel operates. Reference should be made to Merchant Shipping Notice No. M.1389 - Prevention of pollution of the sea by garbage from ships.

Oil Merchant Shipping Notice No. M.1240 - The Merchant Shipping (Prevention of Oil Pollution) Regulations 1993. Application to ships (other than oil tankers) of less than 400 grt - which should be read in conjunction with the Merchant Shipping (Prevention of Oil Pollution) Regulations 1996, SI 1996 No.2154, explains the extent to which a vessel operating in accordance with the Code should comply with the Regulations. Examples of simple oily-water separating arrangements which may be acceptable for small vessels are described in M.1240.

Guidelines for systems for handling oily wastes in machinery spaces of ships (including yachts) are provided in Merchant Shipping Notice No. M.1451 - MARPOL 73/78 - Annex 1. Guidelines for systems for handling oily wastes in machinery spaces of ships. The guidelines apply to ships of which the keels were laid on or after 1 January 1992.

Means to prevent pollution by oil should be acceptable to administrations/authorities in the area in which a vessel operates.

**ANNEX 1 - THE STATUS OF PERSONS CARRIED ON UNITED
KINGDOM SHIPS** (see Section 2)

DEPARTMENT OF TRANSPORT MERCHANT SHIPPING
NOTICE NO. M.1194

**THE STATUS OF PERSONS CARRIED ON UNITED
KINGDOM SHIPS**

This Notice is addressed to Shipowners, Charterers, Masters
and Persons in charge of United Kingdom Ships

1. During an appeal case ** heard in the High Court in 1983, the legal status of persons on board a United Kingdom ship came under close scrutiny; in particular the distinction between "persons engaged on the business of the vessel" and "passengers". As a result of the judgement made in this case it has been decided to give the following guidance regarding the status of persons when carried on board United Kingdom ships.

2. The current legal definition of a passenger is given in Section 26 of the Merchant Shipping Act 1949 which states:

(1) In Part II of the principal Act (ie, the Merchant Shipping Act 1894), in the Merchant Shipping (Safety and Load Lines Conventions) Act 1932, and in this Act, the expression 'passenger' means any person carried in a ship, except

(a) a person employed or engaged in any capacity on board the vessel on the business of the vessel;

(b) a person on board the vessel either in pursuance of the obligation laid upon the master to carry shipwrecked, distressed or other persons, or by reason of any circumstance that neither the master nor the owner nor the charterer (if any) could have prevented or forestalled; and

(c) a child under one year of age.

(2) In the Merchant Shipping (Safety and Load Lines Convention) Act 1932, and in this Act, the expression 'passenger steamer' means a steamer carrying more than twelve passengers. (This definition of a passenger steamer was subsequently amended by Section 17(2) of the Merchant Shipping Act 1964).

3. After carefully studying the Court's judgement of the case it is the Department's view that the only persons who can be considered as being lawfully 'employed or engaged on the business of the vessel' are those over the minimum school leaving age (about 16 years) who:

(i) have a contractually binding agreement to serve on the vessel in some defined capacity and which could include carrying out such duties under training, or are

(ii) duly signed on members of the crew.

~~4. In addition to noting the foregoing, it is recommended that whenever the carriage of passengers is contemplated on any vessel the contents of Merchant Shipping Notice No. 913 should be carefully studied.~~

Department of Transport
Marine Directorate
London WC1V 6LP

October 1985

** The appeal case referred to in this notice was: Secretary of State for Trade v. Charles Hector Booth (Master of the yawl "Biche") [1984] 1 All E.R.; [1984] Lloyd's Rep. 26.

[Explanatory note: paragraph 4. of the Notice has been deleted because it is not valid. Merchant Shipping Notice No. 913 refers to legislation which has been revoked since the above Notice was issued in October 1985.]

**ANNEX 2 - EQUIVALENT SAFETY STANDARDS FOR VESSELS
OPERATING IN PROTECTED WATERS AND/OR A RESTRICTED SERVICE**
(see Section 3.7)

1 General Information

This Annex gives guidance to circumstances where the Maritime and Coastguard Agency Regional Chief Surveyor may allow equivalent safety provisions if they are considered appropriate. In all circumstances it is for the owner to make application and present the case for the acceptance of the equivalent safety standard.

2 Group Working

Where two or more boats are operating in close proximity under the supervision of a single control and satisfactory communications are provided between all boats and the shore then single man operations may be accepted and the requirement for all boats to carry inflatable liferafts and the other safety equipment required by this code may be waived.

The following safety equipment should be provided:-

lifejackets/buoyancy aids for all on board (*);

rescue/retrieval equipment (**);

a minimum of 2 lifebuoys;

6 red hand flares; and

a fixed or portable VHF radio.

Other equipment as considered necessary, for the particular operation, by the Maritime and Coastguard Agency Regional Chief Surveyor.

* It will be a requirement of any agreement to a group working scheme with dispensations from the full standards of the code that an acceptable lifejacket or constant wear buoyancy aid to Health and Safety Executive requirements for personnel working on fish farms is worn at all times by everyone onboard. The carriage of any additional lifejackets will not be required. All lifejackets/buoyancy aids and lifebuoys should be fitted with lights and retro-reflective tape.

** Arrangements will need to be suitable for the overall operation.

Charts and nautical publications need not be provided where the area of operation is limited and the person in charge has demonstrated adequate local knowledge.

An anchor of sufficient mass for the size of the vessel and sufficient cable for the area of operation should be provided.

At least one bilge pump should be provided and on fully decked vessels a bilge alarm should be fitted. On small open or partially decked vessels an efficient bailing system may be acceptable as equivalent to a bilge pump, at the discretion of the Maritime and Coastguard Agency Regional Chief Surveyor.

Fire appliances as detailed in Annex 7 of the Code should be provided.

The requirements for other aspects of the Code such as construction, weathertight integrity, machinery, electrical arrangements, steering gear, intact stability and freeboard may be waived by the Maritime and Coastguard Agency Regional Chief Surveyor if alternative arrangements suitable for the area and type of operation are provided.

2.1 Survey and Certification

When the Maritime and Coastguard Agency Regional Chief Surveyor considers it is appropriate to do so for vessels operating in protected waters the full survey and certification procedures may be replaced by a general inspection of the vessels on any particular site and the issue of a group exemption covering those vessels.

2.2 Manning Qualifications (see Annex 11)

In lieu of the full requirements of the Code, the qualifications (including the need for first aid training) of the single man operator may be considered in relation to the operating area, type of work and working conditions.

3 Individual Vessels

When individual vessels are operating on very restricted service under conditions which are deemed to make any of the requirements of the Code unnecessary in the view of the Maritime and Coastguard Agency Regional Chief Surveyor then the vessel may be considered, surveyed and certificated by the Maritime and Coastguard Agency with consideration to the particular service and appropriate exemptions issued.

ANNEX 3 - LIFE-SAVING APPLIANCES (see Section 13.1)

Area of Operation Category	6	4 and 5	3	2	1
<i>m= nautical miles</i>	<3m	<20m Daylight & Favourable Weather	<20m	³ 20m & <60m	³ 60m & <150m
Liferafts Note 1	Yes	Yes	Yes	Yes	Yes
Lifebuoys Note 2	2	<15 Pers. 2 or ≥15 Pers. 4	<15 Pers. 2 or ≥15 Pers. 4	<15 Pers. 2 or ≥15 Pers. 4	<15 Pers. 2 or ≥15 Pers. 4
Lifebuoy Light	1	1 or 2	1 or 2	1 or 2	1 or 2
Buoyant Line Note 2	1	1 or 2	1 or 2	1 or 2	1 or 2
Lifejacket Note 3	100%	100%	100%	100%	100%
Parachute Flares	None	None	4	4	6
Red Hand Flares	2	2	6	6	6
Smoke Signals	2 Buoyant or Hand Held	2 Buoyant or Hand Held	2 Buoyant or Hand Held	2 Buoyant or Hand Held	2 Buoyant
Thermal Protective Aids (TPA) Note 4	100%	100%	100%	100%	100%
Immersion Suits Note 5	None	None	None	None	Crew 100%
Means to Recover Person from Water	1	1	1	1	1

Note 6					
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Area of Operation Category	6	4 and 5	3	2	1
Portable VHF Note 7	1	1	1	1	1
406MHz EPIRB Note 8	None	None	None	None	1
SART	None	None	None	None	1
General Alarm Note 9	None	None	None	Yes	Yes
Life-Saving Signals Table 2 X SOLAS No.2 or 1 x SOLAS No.1	Yes	Yes	Yes	Yes	Yes
Training Manual Note 10	Yes	Yes	Yes	Yes	Yes
Instructions for Onboard Maintenance Note 11	Yes	Yes	Yes	Yes	Yes

Notes:-

1 Liferafts

1.1 Category 1 vessels carrying 15 or more persons should be provided with liferafts of such number and capacity that, in the event of any one liferaft being lost or rendered unserviceable, there is sufficient capacity remaining for all onboard.

1.2 Category 1 vessels carrying 14 or less persons and vessels of Categories 2, 3, 4, 5 and 6 should be provided with liferaft capacity to accommodate at least the number of persons on board.

1.3 Liferafts on vessels of Category 1 should be of Department of Environment, Transport and the Regions (DETR) approved type equipped with a "SOLAS A PACK" and contained in GRP containers. The liferafts should be stowed on the weather deck or in an open space and fitted with float free arrangements (Hydrostatic Release Units) so that the liferafts float free and inflate automatically.

1.4 Liferafts on new vessels of Category 2, 3, 4, 5 and 6 should be of Department Environment, Transport and the Regions (DETR) approved type equipped with a "SOLAS B PACK" and contained in GRP containers.

1.5 Liferafts on existing vessels should be of the type identified at 1.4 or, if a liferaft of required capacity is already provided, an Offshore Racing Council (ORC) type (ISO 6185 standard) can be accepted by the Certifying Authority. When an ORC type liferaft is replaced it should be replaced by Department of the Environment, Transport and the Regions (DETR) approved type.

If of the ORC type, a liferaft should be fitted with the equivalent "SOLAS B PACK", however it may be necessary to provide the following equipment in a "grab bag":-

- .1 second sea anchor and line;
- .2 a first aid kit;
- .3 one daylight signalling mirror;
- .4 one signalling whistle;
- .5 one radar reflector;
- .6 two red rocket parachute flares;
- .7 three red hand flares;
- .8 one buoyant smoke signal;
- .9 one thermal protective aid for each person onboard;
- .10 one copy of the illustrated table of life-saving signals (SOLAS No.2)

To facilitate rapid abandonment in an emergency the grab bag should be provided in a position accessible and known to all onboard.

1.6 Liferrafts on vessels identified in 1.4 and 1.5 should be stowed on the weather deck or in an open space and fitted with float free arrangements (secured by Hydrostatic Release Units) so that the liferafts float free and inflate automatically; or alternatively,

for Category 3, 4, 5 and 6 vessels in GRP containers (or valise) stowed in a readily accessible and dedicated weathertight locker opening directly to the weather deck.

2 Lifebuoys

The buoyant lines fitted to lifebuoys should be at least 18 metres in length. Buoyant line(s) should be fitted to the lifebuoy(s) not fitted with a lifebuoy light.

3 Lifejackets

If the lifejackets are inflatable an additional 10% or 2 (whichever is the greater) should be provided.

4 Thermal Protective Aids (TPA)

4.1 The additional TPA's to those required by the "SOLAS B PACK" may be stowed in the grab bag (see note 1.5).

4.2 When immersion suits are provided for all persons onboard only 2 TPA's need to be provided for use of injured persons.

5 Immersion Suits

5.1 Immersion suits may be of the non-insulated type.

5.2 Pilot boats are to be provided with immersion suits for all onboard.

5.3 Immersion suits provided are to be compatible with the lifejackets provided.

5.4 Immersion suits may be provided to satisfy the personal clothing requirements in 22.6.2.

6 Means to Recover a Person from the Water (see 22.5 and 25.1.2.)

6.1 The retrieval system may be of an approved type or a system specifically adapted to the vessel which can accomplish the same function.

6.2 The requirement to lift the man-over-board in a horizontal position, while desirable, is considered secondary to the speed of retrieval in order that the person does not become hypothermic.

7 Portable VHF

If a fixed VHF is fitted in a Category 6 vessel a portable VHF set is not required.

Portable (hand-held) VHF sets are to be waterproofed as far as practicable to prevent the ingress of water.

Brief and clear operating instructions should be provided for the hand-held VHF set(s) provided.

8 406 Mhz EPIRB

The EPIRB should be installed in an easily accessible position ready to be manually released, capable of being placed in the liferaft and also capable of floating free with automatic activation if the ship sinks.

9 General Alarm

A general alarm system only needs to be provided on a vessel of 15 metres in length and over.

10 Training Manual

10.1 A training and instruction manual should contain instructions and information on the life-saving appliances provided in the vessel and also contain information on the best methods of survival.

10.2 It may take the form of instructions from the manufacturers of the life-saving equipment provided with the following explained in detail:

- .1 donning of lifejackets;
- .2 boarding, launching, and clearing the survival craft from the vessel;
- .3 illumination in launching areas;
- .4 use of all survival equipment;
- .5 use of all detection equipment;
- .6 with the assistance of illustrations, the use of radio life-saving appliances;
- .7 use of sea anchors;
- .8 recovery of persons from the water;

- .9 hazards of exposure and the need for warm clothing;
- .10 best use of the survival craft facilities in order to survive;
- .11 methods of retrieval, including the use of helicopter rescue gear (slings, baskets, stretchers), breeches-buoy and shore life-saving apparatus;
- .12 instructions for emergency repair of the life-saving appliances;
- .13 personal survival at sea booklet, Merchant Shipping Notice No. M.1585 - Personal survival at sea booklet.

11 Instructions for Onboard Maintenance

11.1 These should contain instructions for onboard maintenance of the life-saving appliances and should include the following where applicable:-

- .1 a check list for use when carrying out the required inspections;
- .2 maintenance and repair instructions;
- .3 schedule of periodic maintenance;
- .4 list of replaceable parts;
- .5 list of sources for spare parts;
- .6 log of records of inspection

and maintenance.

ANNEX 4 - FIRE TEST FOR GRP (see Section 14.1.1.2)

1 Heat Source

The heat source for the fire tests should be provided by a propane gas torch with a Sievert burner type No. 2944 giving a maximum flame temperature of 1600°C and burning propane at the rate of 4110 grams per hour with a pressure of 2kgf/cm. The rate of burning should be carefully controlled. The length of blue flame should be approximately 200mm.

2 Specimen

The specimen should be 450mm x 450mm cut from a one metre square panel of the laminate to be tested. The specimen should not incorporate any of the edges of the one metre square panel. The edges of the specimen should be housed in a steel frame sufficiently to prevent them igniting during the tests. The specimen should be cured for at least 28 days before testing.

3 Test Procedure

The specimen should be oriented vertically in a draft free location, such that the tip of the blue flame (i.e. the point of greatest heat) impinges on the centre of the specimen with the flame normal to its surface. The non gel coat surface of the specimen should be exposed to the flame. The flame should not burn through the specimen within 15 minutes.

ANNEX 5 - IGNITABILITY TEST FOR COMBUSTIBLE INSULATIONS

(see Section 14.1.5.2)

1 Test Specimens

1.1 One specimen is to be prepared

1.2 The specimen is to be a minimum of 150mm x 150mm and of the thickness which is to be used on the vessels, together with any facing with which it is normally covered.

2 Conditioning of Test Specimens (absorbent materials)

2.1 The conditioning atmosphere should have a temperature of $20 \pm 2^{\circ}\text{C}$ and relative humidity of $65 \pm 2\%$.

2.2 The specimen should be laid flat, in the conditioning atmosphere for a period of 24 hours, or for a sufficiently longer period in order to ensure that the mass of the specimen shows no progressive change greater than 0.25% when it is determined at intervals of 2 hours.

3 Atmosphere for Testing

3.1 The test is to be conducted in an atmosphere the same as for conditioning the specimen, or within 2 minutes of removal from the conditioning atmosphere.

3.2 Appropriate measures should be taken to prevent draughts in the vicinity of the testing equipment when testing is in progress.

4 Testing Procedure

4.1 Source of ignition

The source should be obtained by using a burner consisting of a copper tube having a length of 150mm and inside and outside diameters of 5mm and 6mm respectively connected by plastic or rubber tubing to a gas tap supplying natural gas. The copper tube is to have no opening for the supply of air.

4.2 Height of flame

Before the test takes place the burner flame is to be adjusted to a height of 32mm.

4.3 Test Procedure

4.3.1 Place the specimen horizontally on a metal tripod stand with the upper surface of the specimen facing downwards (i.e. with normally exposed face on underside) such that the height of this surface of the specimen is approximately 8mm below the top of the burner flame. Apply the burner flame at right angles to the plane of the specimen in the centre of specimen. After one minute the burner flame is to be removed clear of the specimen and the time in seconds to extinction of any flaming is to be recorded.

4.3.2 The test in paragraph 4.3.1 is to be repeated after any flaming or smouldering has ceased and the temperature of the specimen has returned to normal except that the centre of the burner flame is to be positioned at the midpoint of any edge of the specimen. Again the time in seconds to extinction of any flaming after the removal of the burner is to be recorded.

5 Pass Criteria

An insulation is deemed to be "not readily ignitable" when any flaming of the test specimen ceases within 20 seconds of the removal of the burner.

ANNEX 6 - OPEN FLAME GAS INSTALLATIONS (see Section 14.5.2)

1 General Information

1.1 Possible dangers arising from the use of liquid petroleum gas (LPG) open flame appliances in the marine environment include fire, explosion and asphyxiation due to leakage of gas from the installation.

1.2 Consequently, the siting of gas consuming appliances and storage containers and the provision of adequate ventilation to spaces containing them is most important.

1.3 It is dangerous to sleep in spaces where gas-consuming open-flame appliances are left burning, because of the risk of carbon monoxide poisoning.

1.4 LPG is heavier than air and, if released, may travel some distance whilst seeking the lowest part of a space. Therefore, it is possible for gas to accumulate in relatively inaccessible areas, such as bilges, and diffuse to form an explosive mixture with air, as in the case of petrol vapour.

1.5 A frequent cause of accidents involving LPG installations is the use of unsuitable fittings and improvised "temporary" repairs.

2 Stowage of Gas Containers

2.1 Gas containers should be stowed on the open deck or in a gas-tight enclosure (fitted with a drain) opening on to the deck, so that any gas which may leak can disperse overboard.

2.2 Stowage should be such that containers are positively secured against movement in any foreseeable event.

2.3 In multiple container installations, a non-return valve should be placed in the supply line near to the stop valve on each container. If a change-over device is used, it should be provided with non-return valves to isolate any depleted container.

2.4 When more than one container can supply a system, the system should not be used with a container removed.

2.5 Containers not in use or not being fitted into an installation should have the protecting cap in place over the container valve.

3 Fittings and Pipework

3.1 Solid drawn copper alloy or stainless steel tube with appropriate compression or screwed fittings are recommended for general use for pipework in LPG installations.

3.2 Aluminium or steel tubing or any materials having a low melting point, such as rubber or plastic, should not be used.

3.3 Lengths of flexible piping (if required for flexible connections) should be kept as short as possible and be protected from inadvertent damage. Also, the piping should conform to an appropriate standard.

4 Open-Flame Heaters and Gas Refrigerators

4.1 Such appliances should be well secured so as to avoid movement and, preferably, be of a type where the gas flames are isolated in a totally enclosed shield where the air supply and combustion gas outlets are piped to open air.

4.2 In refrigerators in which the burners are fitted with flame arrestor gauzes, shielding of the flame may be an optional feature.

4.3 Refrigerators should be fitted with a flame failure device.

4.4 An open-flame gas refrigerator should not be fitted in a petrol engined vessel.

4.5 Flueless heaters should be selected only if fitted with atmosphere-sensitive cut-off devices to shut off the gas supply at a carbon dioxide concentration of not more than 1.5 per cent by volume.

4.6 Heaters of a catalytic type should not be used.

4.8 On petrol engined vessels, the flames of open-flame appliances should be extinguished whilst fuelling.

5 Flame Failure Devices

A gas consuming device should be fitted, where practicable, with an automatic gas shut-off device which operates in the event of flame failure.

6 Gas Detection

6.1 Suitable means for detecting the leakage of gas should be provided in a compartment containing a gas-consuming appliance or in any adjoining space or compartment into which the gas (more dense than air) may seep. In this regard, consideration should be given

to equipment which complies with BS EN 50057, Electrical apparatus for the detection and measurement of combustible gases.

6.2 Gas detectors should be securely fixed in the lower part of the compartment in the vicinity of the gas-consuming appliance and other space(s) into which gas may seep.

6.3 A gas detector should be suitable for use in a marine environment and, preferably, be of a type which will be actuated promptly and automatically by the presence of a gas concentration in air of not greater than 0.5 per cent (representing approximately 25 per cent of the lower explosive limit) and should incorporate an audible and a visible alarm.

6.4 When electrical detection equipment is fitted, it should be certified in accordance with BS EN 50057 - Electrical apparatus for the detection and measurement of combustible gases or BS EN 28846 - Electrical devices - Protection against ignition of surrounding flammable gases (i.e. ignition protected for the gas being used) or a recognised equivalent standard.

6.5 In all cases, the arrangements should be such that the detection system can be tested frequently whilst the vessel is in service.

7 Emergency Action

7.1 Given the need to be ever alert for gas leakage, a suitable notice should be displayed prominently in the vessel which details the action to be taken when a gas alarm occurs or a gas leak is suspected.

7.2 The information given should include the following:-

.1 All gas-consuming appliances should be shut off at the main supply from the container(s); and

.2 NO SMOKING should be permitted until it is safe to do so; and

.3 NAKED LIGHTS SHOULD NEVER BE USED AS A MEANS OF LOCATING GAS LEAKS.

ANNEX 7 - FIRE FIGHTING EQUIPMENT (see Section 15.1.1)

1 Vessels of less than 15 metres in length and carrying 14 or less persons

1.1 One manual fire pump (outside the engine space) or one power driven fire pump (outside the engine space)*, with sea and hose connections, capable of delivering one jet of water to any part of the ship through hose and nozzle. One fire hose of adequate length with 10mm nozzle and suitable spray nozzle;

or

One multi-purpose fire extinguisher kite marked to BS EN 3:1996 - Portable fire extinguishers, or equivalent standard, with minimum fire rating of 13A/113B or smaller extinguishers giving the equivalent fire rating (in addition to that required below).

1.2 Fixed fire extinguishing in engine space which may consist of a portable fire extinguisher suitably secured and arranged to discharge into the space. On new vessels the fire fighting medium should be stored outside the machinery space.

1.3 Not less than one multi-purpose fire extinguisher kite marked to BS EN 3:1996 - Portable fire extinguishers, or equivalent standard, with minimum fire rating of 5A/34B provided at each exit from accommodation spaces to the open deck. In no case should there be less than two such extinguishers provided.

1.4 At least two fire buckets with lanyards, Buckets may be of metal, plastic or canvas and should be suitable for their intended service.

1.5 One fire blanket in galley or cooking area (BS 6575 - at least light duty type).

2 Vessels of 15 metres in length and over and vessels carrying 15 or more persons

2.1 One manual fire pump (outside engine space) or one power driven fire pump (outside the engine space)*, with sea and hose connections, capable of delivering one jet of water to any part of the ship through hose and nozzle.

2.2 One fire hose of adequate length with 10mm nozzle and suitable spray nozzle.

2.3 Fixed fire extinguishing in engine space which may consist of a portable extinguisher suitably secured and arranged to discharge into the space.

2.4 Not less than two multi-purpose fire extinguishers kite marked to BS EN 3:1996 - Portable fire extinguishers, or equivalent standard, with a minimum fire rating of 13A/113B.

2.5 At least two fire buckets with lanyards. Buckets may be of metal, plastic or canvas and should be suitable for their intended service.

2.6 One fire blanket in galley or cooking area (BS 6575 - at least light duty type).

3 Notes

3.1 In 1.1 and 2.1 * this may be one of the pumps required by Section 10, when fitted with a suitable change over arrangement which is readily accessible. (The source of power for the fire pump should be sited outside the engine space.)

3.2 Multi-purpose fire extinguishers have a capability to deal with both category A fires (involving solid materials) and category B fires (involving liquids or liquefiable solids) and are marked with the multipurpose rating e.g. 13A/113B in 1.1 and 2.4 above; and 5A/34B in 1.3 above.

3.3 One of the multi-purpose fire extinguishers required above can also be the extinguisher required for discharge into the engine space (1.2 and 2.3), providing it is a suitable type and size and its stowage location is appropriate to its dual use.

3.4 BS EN 3:1996 - Portable fire extinguishers, became a national standard in August 1996. The previous standard, BS 5423:1987, was withdrawn on 1 January 1997. The principal difference between the two standards is the colour coding of the body of the extinguisher which, for BS EN 3, is red. BS EN 3 allows a zone of colour of up to 5% of the external area of the extinguisher body to be used to identify the extinguishing agent. Manufacturers have complied with this by printing the operating instructions in the appropriate extinguishing agent colour.

Manufacturers producing extinguishers kite marked to BS EN 3 cannot revert to the colour schemes contained in the withdrawn BS 5423:1987. Owners of vessels should not overpaint red BS EN 3 extinguishers to the "old" colours.

ANNEX 8 - POWER DRIVEN VESSELS - Lights, shapes and sound appliances (see Section 17.4)

Length of vessel overall	When underway	When at anchor ³	When Not Under Command ⁶	When Aground ⁸	Sound appliances
Less than 7m	All round white + sidelights ^{1,2}	Required ^{4,5}	Not required	Not required	Means to make an efficient sound signal required
7m - 12m	All round white + sidelights ¹ OR Masthead (vis 2 miles) + sidelights ¹ + stern light OR (if lights have to be offset from centreline) combined lantern sidelights plus EITHER all round white OR masthead and sternlight	Required ⁵	Not Required	Not required	Means to make an efficient sound signal required
12m - 20m	Masthead (vis 3 miles) + sidelights + stern light	Required ⁵	Required ^{5,7}	Required ^{5,7}	Whistle and bell required
20m - 24m	Masthead (vis 5 miles) + sidelights + sternlight	Required	Required	Required	Whistle and bell required

¹ Range of sidelight is 1 mile.

² Vessels not exceeding 7 knots maximum speed should show sidelights if practicable.

- ³ By night, all round white light where best seen; by day one black ball (0.6 metres in diameter) in the fore part.
- ⁴ Anchor light is required only when anchored in or near a narrow channel, fairway or anchorage or where other vessels normally navigate.
- ⁵ Size of the daytime shapes and distances apart may be reduced commensurate with size of vessel.
- ⁶ By night, two all round red lights in a vertical line two metres apart and the lowest not less than four metres above the hull; by day two black balls (0.6 metres in diameters) in a vertical line, 1.5 metres apart.
- ⁷ The distances for the lights may be reduced to one metre apart and two metres above the hull.
- ⁸ By night two all round red lights in a vertical line 2 metres apart plus anchor light; by day three black balls (0.6 metres diameter) in a vertical line, 1.5 metres apart.

Notes

Sidelights, sternlight and all round lights have range of 2 miles unless indicated otherwise.

Range of all round white or anchor or Not Under Control (NUC) lights is 2 miles in all cases.

All lights (and whistles and bells when they are required to be carried) must be type approved for the size of vessel on which they are fitted.

ANNEX 9 - ANCHORS AND CABLES (see Section 20.1)

$\frac{\text{Length} + \text{Lwl}}{2}$	Anchor Mass		Anchor Cable Diameter			
	Main	Kedge	Main Chain	Main Rope	Kedge Chain	Kedge Rope
(metres)	(kg)	(kg)	(mm)	(mm)	(mm)	(mm)
6	8	4	6	12	6	10
7	9	4	8	12	6	10
8	10	5	8	12	6	10
9	11	5	8	12	6	10
10	13	6	8	12	6	10
11	15	7	8	12	6	10
12	18	9	8	14	8	12
13	21	10	10	14	8	12
14	24	12	10	14	8	12
15	27	13	10	-	8	12
16	30	15	10	-	8	12
17	34	17	10	-	8	14
18	38	19	10	-	8	14
19	42	21	12	-	10	14
20	47	23	12	-	10	14
21	52	26	12	-	10	14
22	57	28	12	-	10	16
23	62	31	12	-	10	16
24	68	34	12	-	10	16

Notes:

- 1 Chain cable diameter given is for short link chain. Chain cable should be sized in accordance with EN 24 565:1989 (covering ISO 4565:1986 and covered by BS 7160:1990 - Anchor chains for small craft), or equivalent.
- 2 The rope diameter given is for nylon construction. When rope of another construction is proposed, the breaking load should be not less than that of the nylon rope specified in the table.
- 3 When anchors and cables are manufactured to imperial sizes, the metric equivalent of the anchor mass and the cable diameter should not be less than the table value.
- 4 Lwl is the waterline length of the vessel when the vessel is floating at the assigned freeboard draught.

**ANNEX 10 - EXPOSURE OF PERSONNEL TO POTENTIALLY HARMFUL
NOISE**
(see Section 22.7.7)

(Edited extracts from Section 8 of the "Code of practice for noise levels in ships", second edition, 1992, published by HMSO)

- 1 The following figures illustrate the acceptable maximum daily noise doses for unprotected ears, based on dB(A) sound energy received:-

less than	80dB(A)	for	no limit (24 hours)
	82dB(A)	for	16 hours
	85dB(A)	for	8 hours
	90dB(A)	for	2 hours
	95dB(A)	for	50 minutes
	100dB(A)	for	15 minutes
	105dB(A)	for	5 minutes
	110dB(A)	for	1 minute

- 2 The following examples of noise levels in different locations to allow personnel to gauge the existence of conditions giving potentially harmful noise exposure:-

120dB(A)	between 2 running 1800 rpm diesel generators
110dB(A)	in a small ship engine room with 900 rpm diesel main engines and 1550 rpm generator
105dB(A)	1 metre from the cylinder tops of a slow speed (120 rpm) diesel main engine
100dB(A)	between 2 running 600 rpm diesel generators
95dB(A)	in a slow speed (120 rpm) diesel main engine room at the aft end on the floor plate level
90dB(A)	machine shop or quieter parts of ship's engine room
80dB(A)	15 metres from a pneumatic drill
70dB(A)	vacuum cleaner at 3 metres
60dB(A)	inside a supermarket
50dB(A)	inside a house in a suburban area during daytime

(These levels are only approximate as engine noise varies considerably with type of installation.)

ANNEX 11 - THE MANNING OF WORKBOATS (see Section 26.1)

This Annex gives information relating to the manning and operation of small workboats and pilot boats as follows:

- Paragraph 1 - Areas of Application
- Paragraph 2 - Minimum Qualifications of the person in charge of the vessel and the additional person when required to be carried
- Paragraph 3 - DOT Boatmasters' and Boatmen's Licences
- Paragraph 4 - Revalidation of Certificates and Licences
- Paragraph 5 - Approved Engine Course
- Paragraph 6 - Approved Stability Course
- Paragraph 7 - Responsibility of the Owner/Managing Agent for the Safe Manning of the vessel
- Paragraph 8 - Keeping a Safe Navigational Watch
- Paragraph 9 - Withdrawal of Certificate
- Paragraph 10 - Phasing in Arrangements

General

All references to DOT should be taken as applying to the Maritime and Coastguard Agency. The Department of Transport (DOT) became the Department of the Environment, Transport and the Regions (DETR) on the 16th June 1997.

References to RYA are to the Royal Yachting Association.

Vessels of less than 24 metres in length carrying not more than 12 passengers, being commercially operated Motor Vessels as defined in Section 1 of the Code, and which comply with the requirements of the Code will be exempt from the need to comply fully with the Merchant Shipping (Training and Certification) Regulations 1997, SI 1997 No.348, and the Merchant Shipping (Safe Manning, Hours of Work and Watchkeeping) Regulations 1997, provided the manning of the vessel, when operating in the areas described in 1 below, is in accordance with the standards given in paragraph 2 below.

Where two or more boats are operating in close proximity under the supervision of a single control and satisfactory communications are provided between all boats and the shore then single man operations may be accepted and in lieu of the full requirements of this Annex the qualifications (including the need for first aid training) of the single man operator may be considered in relation to the operating area, type of work and working conditions (see Section 3.7 and Annex 2 of the Code).

Any craft which does not readily fit the description of 'Conventional power-driven vessels' will be considered upon its merits.

At all times a Pilot Boat shall be manned by a minimum of two adult persons, namely a coxswain and a deckhand who can assist the pilot when embarking or disembarking (see Section 25.1.2 of the Code).

1 Areas of Application

Commercially operated motor vessels operating within the following areas should carry at least the qualified personnel shown in Section 2 below:-

Area category 6	Within 3 miles of land and not more than 3 miles radius from either the point of departure to sea or from the seaward boundary of protected waters;
Area category 5	Up to 20 miles from a nominated departure point(s), in favourable weather and in daylight;
Area category 4	Up to 20 miles from a safe haven, in favourable weather and in daylight
Area category 3	Up to 20 miles from a safe haven
Area category 2	Up to 60 miles from a safe haven
Area category 1	Up to 150 miles from a safe haven

2 Minimum Qualifications of the Person in Charge of the Vessel (Skipper) and of the Additional Persons Required to be Carried On Board

2.1 Endorsement of Certificates

All RYA/DOT certificates of competency and/or service should carry the endorsement - "*valid for vessels of up to 24 metres in length used for commercial purposes*".

2.2 Qualifications Required

2.2.1 Area category 6 **Within 3 miles of land and not more than 3 miles radius from either the point of departure to sea or from the seaward boundary of protected waters**

The skipper should hold at least:-

- .1 RYA/DOT Certificate of Competency or Service as Coastal Skipper (Motor), or
- .2 DOT Boatmasters' Licence Grade 3 (modified) for the appropriate area, or
- .3 A Local Authority Licence for the appropriate area (only those Local Authorities that have the approval of the Maritime and Coastguard Agency may issue such Licences under this Code), or

.4 A Certificate of Competency for the appropriate area issued by a Competent Authority as defined in Section 2 of this Code, or

.5 RYA/DOT Advanced Powerboat certificate, or

.6 RYA/DOT Powerboat Level 2 certificate (for daylight service only).

A second person capable of assisting the Skipper in an emergency should also be on board.

NOTES: Workboats operating in area category 6 may be single manned provided that two or more boats are working in company and in communication with and in close proximity to each other such that they are capable of rendering assistance in the event of an emergency (see Section 3.7 and Annex 2 of the Code).

Pilot boats will not be permitted to operate with less than two adult persons aboard (see Section 25.1.2 of the Code).

The Boatmasters' Licence Grade 3 (modified) is a MCA Boatmasters' Licence that is restricted to use in non-passenger vessels operating within specified geographical limits. The criteria upon which the candidate is examined are determined according to the vessel(s) and operation(s) involved.

2.2.2 Area category 5 Up to 20 miles from a nominated departure point(s), in favourable weather and in daylight

Area category 4 Up to 20 miles from a safe haven, in favourable weather and in daylight

The skipper should hold at least:-

.1 RYA/DOT Certificate of Competency or Service as Coastal Skipper (Motor), or

.2 DOT Boatmasters' Licence Grade 3 (modified) for the appropriate area, or

.3 A Certificate of Competency for the appropriate area issued by a Competent Authority as defined in Section 2 of this Code, or

.4 RYA/DOT Advanced Powerboat certificate.

A second person capable of assisting the Skipper in an emergency should also be on board.

2.2.3 Area category 3 Up to 20 miles from a safe haven

The skipper should hold at least:-

- .1 RYA/DOT Certificate of Competency or Service as Coastal Skipper (Motor), or
- .2 DOT Boatmasters' Licence Grade 3 (modified) for the appropriate area, or
- .3 A Certificate of Competency for the appropriate area issued by a Competent Authority as defined in Section 2 of this Code, or
- .4 RYA/DOT Advanced Powerboat certificate.

A second person capable of assisting the Skipper in an emergency should also be on board.

2.2.4 Area category 2 Up to 60 miles from a safe haven

The skipper should hold at least:-

- .1 RYA/DOT Certificate of Competency or Service as Yachtmaster Offshore (Motor),
or
- .2 DOT Boatmasters' Licence Grade 3 (modified) for the appropriate area.

There should also be on board a second person deemed by the skipper to be experienced.

One of the persons referred to above should be familiar with the operation and maintenance of the main propulsion machinery of the vessel, and should have attended an Approved Engine Course or satisfied the Maritime and Coastguard Agency as to their appropriate engineering experience and competency.

2.2.5 Area category 1 Up to 150 miles from a safe haven

The skipper should hold at least:-

RYA/DOT Certificate of Competency or Service as Yachtmaster Offshore (Motor),

There should also be on board a second person holding at least an RYA/DOT Certificate of Competency or Service as Coastal Skipper (Motor).

One of the persons referred to above should be familiar with the operation and maintenance of the main propulsion machinery of the vessel, and should hold a Marine Engine Operators Licence.

2.2.6 Single Handed Operations

The Maritime and Coastguard Agency does not recommend single handed operations. Workboats, other than those engaged as Pilot Boats or any other business which involves the transfer of personnel at sea, may be operated single handed providing that the person operating the vessel complies fully with the minimum requirements for a skipper (appropriately qualified for the operating area) and the following conditions :-

- .1 the area of operation is restricted to area category 3, 4, 5 or 6 in conditions of favourable weather and subject to favourable official weather forecasts for the area throughout the period of operation; and
- .2 the duration of the voyage should not exceed 8 hours; and
- .3 the vessel is not operated single handed in conditions of restricted visibility; and
- .4 an acceptable lifejacket or buoyancy aid is worn at all time by the skipper; and
- .5 no overside working takes place whilst the vessel is being operated single handed; and
- .6 details of the time and point of departure, voyage plan and the Expected Time of Arrival (ETA) of every single handed voyage are left with a suitable person ashore and that person is notified of the safe arrival on completion of each voyage; and
- .7 communication should be made with a person ashore at regular agreed intervals, and
- .8 the vessel has a certificate endorsed by the Certifying Authority as '*suitable for single handed operations*'.

In some cases, because of the size and arrangement of the vessel, the Maritime and Coastguard Agency may deem the vessel not to be suitable for single handed operations (see Section 26.5). In all cases where single handed operations are carried out, the owner/managing agent and the skipper should be satisfied that it is safe to do so.

2.2.7 Radio Qualifications

Every vessel should carry at least one person holding a Radio Operator's Certificate suitable for the radio equipment on board.

2.2.8 Medical Fitness Certificates

The skipper should provide any of the following items of evidence of medical fitness: a DOT Medical Report (ML5), on application for a boatmasters' license or a Department of Transport Medical Fitness Certificate (ENG1) issued under the provisions of the Merchant Shipping (Medical Examination) Regulations 1983 or a certificate of medical fitness issued by the Civil Aviation Authority.

Alternatively, a DOT Medical Report (D4) on application for a licence to drive large goods and passenger carrying vehicles or a Health and Safety Executive Medical Report for a commercial diver may be accepted but in addition a colour vision test will then be required.

2.2.9 Basic Sea Survival Course

Skippers of vessels that are required to carry inflatable liferafts under this Code should hold an approved Basic Sea Survival Course Certificate.

2.2.10 First Aid Courses

The Skipper or another member of the crew should hold either:

- .1 DOT First Aid at Sea Certificate, or
- .2 Certificate issued by a voluntary society following the successful completion of a first aid course approved by the Health and Safety Executive. Such courses should have extra emphasis on the treatment of hypothermia and casualty evacuation, or
- .3 RYA Small Craft First Aid Certificate

Skippers of vessels operating in area category 1 should hold a DOT Ship Captain's Medical Training Certificate unless another member of the crew holds a medical or nursing qualification of an equivalent or a higher standard.

2.2.11 Stability

The Skipper of any vessel which is required to be provided with an approved stability booklet should have attended an approved Stability Course for Workboats or be able to satisfy the Maritime and Coastguard Agency that he/she has adequate knowledge of the subject.

2.2.12 Radar Training

In any vessel that carries radar, the Skipper and any member of the crew who is liable to use the radar are strongly recommended to undertake appropriate training in its use.

3 DOT Boatmasters' and Boatmen's Licences

A person holding a valid DOT Boatman's Licence issued prior to this Code of Practice coming into force should be considered, subject to having the relevant experience, to be properly qualified only for the voyages in area category 2, 3 or 4, provided that only one nominated safe haven is indicated on the vessel's safety certificate.

The holders of existing DOT Boatman's Licences should exchange these for DOT Boatmasters' Licences at their local Maritime and Coastguard Agency Regional Marine Offices. There is no charge for this service. Merchant Shipping Notice No. M.1525 - Boatmasters' licences, hours of work, manning and training (local passenger vessels), applies.

4 Revalidation of Certificates and Licences

All RYA/DOT Yachtmaster Certificates, whether of competency or service, Boatmasters' Licences and Local Authority Licences should be revalidated every five years. To revalidate, the applicant should prove at least 150 days of actual sea service on appropriate vessels during the previous 5 years and be in possession of a valid Medical Fitness Certificate.

Applicants for revalidation who are not able to prove the requisite sea service but are able to demonstrate that during at least half of the 5 year period they have been employed on duties closely associated with the management and operation of one or more of the appropriate types of vessels, may have their Certificates or Licences considered for revalidation.

5 Approved Engine Course

An Approved Engine Course is a course of at least thirty hours duration which is approved or recognised by the Department of the Environment, Transport and the Regions. A "Certificate of Attendance" will be given by the course organisers to persons satisfactorily completing the course.

Persons who are able to demonstrate to the satisfaction of the MCA that they have the appropriate engineering experience and competency may be granted exemption from the requirement to attend an Approved Engine Course.

(Such a Course will cover the following topics:-

Introduction to compression ignition and spark ignition engines; engine cycles; construction and operational details; fuel, air, cooling, lubrication and electrical systems; power transmission; hull fittings; oil and garbage pollution prevention; safe working practices; basic fire prevention and fire fighting techniques; dangers of asphyxiation in the use of CO₂ and HALON; safety requirements of bottled gas installations; fault finding and rectification within all topics.)

6 Approved Stability Course

An approved Stability Course is a course concentrating upon the fundamentals of practical stability which is approved or recognised by the Department of the Environment, Transport and the Regions. A "Certificate of Attendance" will be given by the course organisers to persons satisfactorily completing the course.

(Such a Course will cover typically the following topics:-

General principles of workboat stability; heeling forces and their causes; wind pressure on projected areas; application and effects of asymmetric loading; overtight mooring; equilibrium in the heeled condition; simple dynamic balance; effect of liquid free surface and its control; cranes, their operation and safe operating limits.)

7 Responsibility of the Owner/Managing Agent for Safe Manning of the Vessel

It is the responsibility of the owner/managing agent to ensure that the skipper and where necessary the crew of the vessel have, in addition to any qualifications required in paragraph 2 above, recent and relevant experience of the type and size of vessel, the machinery on the vessel, and the type of operation in which the vessel is engaged. The owner/managing agent should also ensure that there are sufficient additional crew on board having regard to the type and duration of voyage being undertaken.

8 Keeping a Safe Navigational Watch

It is the responsibility of the skipper to ensure that there is, at all times, a person with adequate experience in charge of the navigational watch. In taking this decision the skipper should take into account all the factors affecting the safety of the vessel, including:-

- .1 the present and forecast state of the weather, visibility and sea;
- .2 the proximity of navigational hazards; and
- .3 the density of traffic in the area.

9 Withdrawal of Certificates of Competency or Service

The Yachtmaster Qualifications Panel reserves the right to withdraw a RYA/DOT Certificate of Competency or Certificate of Service at any time if due cause is shown.

10 Phasing in Arrangements

- .1 Until one year from the date of coming into force of the Code's enabling legislation, existing skippers of UK small workboats and pilot boats who do not already hold the Certificates of Competence required by the Code will be eligible to be issued with a Certificate of Service appropriate to their previous experience. Any such Certificates of Service may be limited as to the area of operation.

The Certificates of Service will be issued by the RYA to the applicant upon satisfactory proof of sea service.

Applicants for Certificates of Service should also obtain the appropriate qualification in First Aid.

- .2 Applicants for Coastal Skipper Certificate of Service should have a total of at least two years experience on UK vessels of which at least 100 days should have been spent actually at sea. Included in this two years at least one year, which includes at least 50 days actually at sea, should have been served as skipper of a UK small workboat or pilot boat.

- .3 Applicants for Yachtmaster Offshore Certificate of Service should have a total of at least five years experience on UK vessels of which at least 250 days should have been spent actually at sea. Included in this five years at least two years, which includes at least 100 days actually at sea, should have been served as skipper of a UK small workboat or pilot boat. Additionally, the required sea service should include at least 12 voyages of over 60 miles and at least 6 of these voyages should have been served in the capacity of skipper of a UK small workboat or pilot boat.

ANNEX 12 - VESSELS WITH PASSENGERS ONBOARD - SAFETY BRIEFING
(see Section 26.4)

- 1 Before the commencement of any voyage the skipper should ensure that all persons onboard are briefed on the stowage and use of personal safety equipment such as lifejackets, thermal protective aids and lifebuoys, and the procedures to be followed in cases of emergency.

- 2 In addition to the requirements of 1, the skipper should brief at least one other person who will be sailing on the voyage regarding the following:-
 - .1 Location of liferafts and the method of launching;
 - .2 Procedures for the recovery of a person from the sea;
 - .3 Location and use of pyrotechnics;
 - .4 Procedures and operation of radios carried onboard;
 - .5 Location of navigation and other light switches;
 - .6 Location and use of firefighting equipment;
 - .7 Method of starting, stopping, and controlling the main engine; and
 - .8 Method of navigating to a suitable port of refuge.

Safety cards will be considered to be an acceptable way of providing the above information.

ANNEX 13 - WORKBOAT CERTIFICATE (see Section 27.2.1.4)

(Seal/Crest and Name of Issuing Authority)

Issued under the authority of the Maritime and Coastguard Agency of the United Kingdom

Department of the Environment, Transport and the Regions

WORKBOAT CERTIFICATE

Name of Vessel.....	Name & Address of
Owner/Managing Agent.....	
Official No.....
Port of Registry.....
Gross Tonnage	
Maximum Number of Persons to be carried (including crew)	Length Overall
length)	Load Line Length (safety
Date of Build.....	Hull Identification Number.....

This is to certify that the above named vessel was examined by

of

at on

and found to be in accordance with the requirements of the Code of Practice for the Construction, Machinery, Equipment, Stability, Operation, Manning and Examination of workboats of up to 24 metres load line length and pilot boats, published by the Maritime and Coastguard Agency of the Department of the Environment, Transport and the Regions.

This certificate will remain valid until subject to the vessel, its machinery and equipment being efficiently maintained, annual examinations and manning complying with the Code of Practice, and to the following conditions:-

.....
The vessel is to be examined out of the water

.....
The permitted area of operation is

.....
Maximum permissible weight of cargo and passengers which can be carried is.....

Issued at on 19

For and behalf of

Name Signature

Date

(OFFICIAL STAMP)

PILOT BOAT ENDORSEMENT

In addition to the general requirements of the Safety of Small Workboats and Pilot Boats - A Code of Practice, this vessel has been examined with regard to Sections 27.4.1 and 27.4.2 of the Code and has been found satisfactory for use as a pilot boat for operations in with the carriage of not more than persons (including the crew).

Issued at..... on.....19.....
For and behalf of
Name.....Signature.....
Date.....

Record of Annual Examinations

This is to certify that at the annual examination required by Section 27.3.3 of the Safety of Small Workboats and Pilot Boats - A Code of Practice, this vessel was found to comply with the relevant provisions of the Code.

First examination;
Conducted at Date made.....
Authorised person of.....
Signature Date

Second examination;
Conducted at Date made.....
Authorised person of.....
Signature Date

Third examination;
Conducted at Date made.....
Authorised person of.....
Signature Date

Fourth examination;
Conducted at Date made.....
Authorised person of.....
Signature Date

ANNEX 14 - PILOT BOAT CERTIFICATE (see Section 27.4.2.1)

(Seal/Crest and Name of Issuing Authority)

Issued under the authority of the Maritime and Coastguard Agency of the United Kingdom

Department of the Environment, Transport and the Regions

PILOT BOAT CERTIFICATE

Name of Vessel.....	Name & Address of
Owner/Managing Agent.....	
Official No.....
Port of Registry.....
Gross Tonnage	
Maximum Number of Persons to be carried (including crew)	Length Overall
length)	Load Line Length (safety
Date of Build.....	Hull Identification Number.....

This is to certify that the above named pilot boat was examined by

of

at on

and found to be in accordance with the requirements of the Code of Practice for the Construction, Machinery, Equipment, Stability, Operation, Manning and Examination of workboats of up to 24 metres load line length and pilot boats, published by the Maritime and Coastguard Agency of the Department of the Environment, Transport and the Regions.

This certificate will remain valid until subject to the vessel, its machinery and equipment being efficiently maintained, intermediate examination and manning complying with the Code of Practice, and to the following conditions:-

.....
.....
.....

The permitted area of operation is:-

.....

Issued at on 19

For and behalf of

Name Signature

Date

(OFFICIAL STAMP)

