

appendices

appendix a – nature of fuels

a) LPG

Liquefied Petroleum Gas (LPG) is a mixture of light hydrocarbons, gaseous at normal temperature and pressure and maintained in the liquid state by increased pressure or lowered temperature.

The two liquefied petroleum gases in general use are 'commercial butane' and 'commercial propane'. They exist as gases at normal ambient temperatures but can be liquefied under moderate pressure. Propane has a lower 'boiling point' than butane, which means it turns into gas at a lower temperature. In order for it to become liquefied, propane is stored under higher pressure, approximately 7 bar as opposed to about 2 bar for butane.

LPG liquid is colourless and its density as a liquid is approximately half that of water. If LPG liquid is spilt onto water, it will float on the surface before vapourising. One volume of liquid produces approximately 250 volumes of gas and thus a leak of liquid poses a considerable hazard.

LPG vapour is heavier than air, butane about twice as heavy and propane about one and a half times heavier. Because of this, LPG vapour will tend to fall to low level and flow along cockpit floors, bilges and other low lying places. LPG vapour may travel some distance and in poorly ventilated places the vapour may persist for some time.

A mixture of LPG and air at a concentration of LPG between 2% and 10% is a flammable mix. Outside of this range the mixture is either too weak or too rich to ignite. If vapour within the flammable range is present in a confined space an explosion will result from ignition.

There have been incidents in which escapes of LPG have been ignited resulting in serious fires or explosions. If the escape is into confined spaces and becomes ignited, the occupants of the craft, or persons in the vicinity could be put at serious risk. It is also possible for vapour/air mixtures arising from leaks or other causes to be ignited some distance from the point of escape and the flame travel back to the source.

In extreme cases, if the cylinder is lying on its side or if the cylinder valve is faulty or if the exposure to the fire is extended, the cylinder may rupture leading to a violent explosion.

If an LPG cylinder is involved in a fire started elsewhere on the craft, the cylinder may be subject to direct flame impingement. After a period of exposure to extreme heat the pressure may rise inside the cylinder to a point where the pressure relief valve may operate releasing LPG under pressure causing a significant jet of burning gas.

At very high concentrations, as LPG vapour replaces available oxygen it will act initially as an anaesthetic and subsequently as an asphyxiate.

[Source BSS Technical Manual]

In the vapour phase LPG exists as a heavy gas, being approximately one and a half to two times the density of air. LPG vapours are heavier than air and will stay close to the ground seeking to enter trenches, drains and other low areas. Dispersion of these vapours will also take longer than would be the case with gases lighter than air. For this reason LPG should not be stored or used in locations where any escape could concentrate in low lying areas or enter drains, trenches or basement areas.

In its refined state, LPG is normally odourless. To detect leaks easily, using the sense of smell, the published Standards for commercial butane and propane call for the gas to have a characteristic odour. This is usually achieved by the addition of a stenching agent.

The odour required has to be sufficiently strong to ensure detection, by smell, of a leakage down to a concentration in air of one fifth of the lower limit of flammability.

A mixture of LPG and air is flammable within certain concentrations, known as the flammable range. This range is 1.8% to 9.0% for BUTANE and 2.2% to 10% for PROPANE. These are approximate values at atmospheric pressure. At higher pressures, or with oxygen, the flammability limits are different.

An accidental release of LPG will be too rich to burn until it has mixed with air and will tend to settle in low places. On the fringe the gas cloud will mix with air and if the resultant combustible mixture reaches an ignition source, it will ignite. Heat generated by the burning gas causes turbulence and further mixing results such that, eventually, most of the gas will become

mixed within the flammable range. A serious hazard may then result. *[Source, LPGA, LPG Fundamentals]*

b) petrol

Petrol evaporates easily and quickly to the atmosphere to give rise to extremely flammable vapours. The vapours given off are three to four times heavier than air. They sink to the lowest level of their surroundings and will accumulate at low level in places such as pits, depressions, the hulls of boats or in enclosed spaces such as the cabins and cockpits of boats.

For petrol vapour to ignite in air, the mixture of vapours must fall within certain concentrations; defined as the upper and lower explosive limits. For petrol concentrations below 1.4%, in air the mixture is too lean to ignite, and for those above 7.6% too rich; at all concentrations between these two limits, a mixture of petrol vapour and air will burn. Hence whenever petrol vapours are released, although they may be too rich initially to burn, they will always pass through the flammable range to give a mixture that is capable of being ignited before they are eventually diluted to safe levels. How long flammable concentrations of vapours persist and how far they travel before being diluted to a safe level will depend on the rate of release of the vapours and the level of ventilation acting to disperse them.

Petrol vapours will not only be released from any spilt product but, because of the ease with which it evaporates, they are released in significant quantities whenever petrol is handled, dispensed or transferred from one container to another. As a consequence of the flammable limits, petrol vapour when diluted 70 fold with air will still give rise to a flammable mixture and it can be calculated that one litre of petrol can, on evaporation, give rise to proximately 15 cubic metres of a flammable petrol/air mixture. *[Source letter dated 25 September 1997 from HSE Principle Inspector John Hazledean]*

c) diesel

Liquids do not burn – it is the vapour given off under heating which sustains combustion. Unless a fuel is very volatile it will require heating to reach the vapour production stage and the temperature at which this is achieved is termed the flash point.

The quoted minimum flash point for diesel fuel is 56°C. Winter diesel can contain increased proportions of the more volatile constituents and this may lower the flash point.

Heat released from the combustion of 1kg of diesel is around 45 MJ (equivalent to 12.5 kWh – six two-bar electric fires turned on for one hour. The difference being that, in a conflagration, this heat is released over a much shorter period).

The temperature of a flame is dependent upon a number of variables but temperature of convected gas of 800°C to 1000°C is quoted by FPA Library of Fire Safety Vol 2 and flame temperatures may be higher (e.g. temperature of flame from combustion of methane in air ranges from 1200°C to 2700°C).

Ignition points – electrical sparks reach temperatures of up to 10000°C, frictional sparks 1000°C and 1500°C, and small fires 2000°C.

Diesel does not ignite readily unless provided with a wick but it will assist the spread of an established fire.

Diesel fuel should be considered as a combustible liquid. It does not ignite readily unless provided with a wick but it will greatly assist the spread of an established fire. Diesel fuel may react with oxidising substances and its vapour may explode if compressed. *[Source, Fire Protection Association, Library of Fire safety, Volume 2]*

d) hydrogen

Colourless, odourless, highly flammable and explosive, it forms ignitable mixtures with air over a very wide range of concentrations. It is very buoyant (much lighter than air) and explosive mixtures are formed very quickly. Flammable limits 4.9 to 75% by volume in air. It may be ignited by contact with catalytic substances at temperatures considerably below its auto-ignition temperature. Very easily ignited by low-energy sparks.

Considered non-toxic but acts as an asphyxiant at high concentrations. *[Source, Fire Protection Association, Fire and Hazardous Substances Volume 2]*

appendix b – scope of the scheme

The Boat Safety Scheme Standards shall apply to all powered vessels, all vessels let out for hire or reward except those stated in Standard 10.8, or vessels carrying fuel or fitted with domestic cooking, heating, refrigerating or lighting appliances.

1.1

A vessel for which there is in force a valid Passenger Certificate issued under the Merchant Shipping Regulations shall not be required to comply with these Standards where the Regulations and associated Guidance Notes for Surveyors specify different requirements.

(Note: The Guidance Notes for surveyors are incorporated in the Boat Safety Scheme Technical Manual). 1.2

A Boat Safety Certificate is not required in respect of any privately owned open vessel (i.e. a vessel in which all the accommodation is completely open to the elements) not carrying or fitted with domestic cooking, heating, refrigerating or lighting appliances and propelled solely by an outboard engine installation provided that the installation complies with the requirements of Parts 3 and 4 in respect of electrical installations and Part 5 in respect of internal combustion engines.

(Note: Fire extinguishers are considered to be an essential safety item in any vessel which carries fuel. It is strongly recommended that boats not requiring to be certificated under Standard 1.3 should carry a fire extinguisher(s) in accordance with Standard 6.1). 1.3

A valid Boat Safety Certificate may not be required to accompany applications for licences/certificates with a validity of up to 28 days which permit the passage of the vessel on certain waterways. 1.4

Navigation authority maintenance craft shall comply with these Standards except that:

- i) where it is not practicable to provide a second means of escape (Standard 6.7 refers) cooking, heating or fuel burning appliances shall be situated at the end of the cabin remote from the exit.
- ii) the provision of guard-rails around the perimeter of the deck (Standard 10.2 refers) may not be required due to the nature of work undertaken by such vessels. 1.5

All commercial vessels on cruising and remainder waterways shall comply with these Standards except that the provision of guard-rails around the perimeter of the deck (Standard 10.2 refers) may not be required due to the nature of work undertaken by such vessels. 1.6

appendix c – recreational craft directive (RCD)

CE marked craft conforming to the detailed requirements of those relevant European standards developed in support of the Recreational Craft Directive (RCD) are equally as acceptable for licensing as those conforming to BSS Standards. Equivalent methods used by boat builders to achieve compliance with the essential safety requirements of the Directive are also acceptable.

For new craft, CE marked to the RCD, a suitable boat builder Declaration of Conformity will be accepted for licensing purposes by navigation authorities. Ordinarily such craft will not be required to undergo a BSS examination for the first four years.

appendix d – complaints procedure

If you have a complaint about the Boat Safety Scheme or the way it is operated, in the first instance please contact the General Manager, Boat Safety Scheme, Willow Grange, Church Road, Watford, WD17 4QA




Tel: 01923 201278 Fax: 01923 201420

appendix e – technical changes

will the boat safety scheme technical requirements change?

Yes. To take account of advances in technology or new safety issues, we may change the requirements from time to time.

Before any changes are made, we will:

-  consult the Inland Waterways Amenity Advisory Council about the proposed changes
-  consult organisations that represent builders, owners and operators of boats affected by the proposed changes
-  bring the proposed changes to the attention of builders, owners and operators and give at least 84 days notice about when they will come into effect. In exceptional cases, where the changes are needed to avoid serious risk of danger to people or property, less than 84 days notice may be given.

appendix f – standards

part 2 – inboard engines

- 2.1 Filling pipes shall be taken to deck level or so arranged as to ensure that any fuel overflowing will not be discharged into any part of the vessel including the bilges.
- 2.2 The filling pipe shall have an internal diameter of at least 38mm (1^{1/2}ins), and any flexible hose shall be of non-kinking material suitable for the fuel used, and must be connected with leakproof joints between the top of the tank and a screwcap or plate forming the filling connection. Deck filling connections shall be outside the coaming. All flexible hoses shall be adequately supported and of minimum practicable length, with all joints or connections readily accessible. [see Exemption 11.1]
- 2.3 All deck and fuel filling connections shall be situated so as to minimise the risk of cross-contamination and shall be clearly marked on the deck fittings or immediately beside then indicating the purpose of each connection and, in the case of fuel connections, the exact type of fuel.
- 2.4 A vent pipe of minimum practicable length with an internal diameter of not less than 12mm (1/2ins) shall be fitted at the highest point of every fuel tank and connected with leakproof joints. The material used shall be non-kinking and suitable for use with the fuel concerned. [see Exemption 11.2]
- 2.5 A vent pipe shall extend to a height equal to or greater than that of the deck filling connection and the open end of a vent pipe shall be fitted in a position where no danger will be incurred from escaping fuel or vapour. Each opening shall be furnished with an effective wire gauze diaphragm flame arrester of non-corrosive material. The flame arrester shall be fitted with gauze of mesh not less than 11 to the linear centimetre (28 to the linear ins.) and the total area of the clear openings of the gauze shall not be less than the cross-sectional area of the air pipe.
- 2.6 Fuel tanks shall be properly secured and be installed as low as practicable and shall be constructed of a suitable non-corrosive material. Materials used in the construction of fuel tanks shall have a fire resistance of 30 minutes in accordance with BS 476: Part 20. Tanks shall have sustained a pressure test of 0.25kgf/cm² (3.5lbf/in²) before installation and be marked to indicate this. All joints and seams of tanks shall be efficiently welded, brazed or close rivetted to sustain a pressure test of 0.25kgf/cm² (3.5lbf/in²). [see Exemption 11.3]
- 2.7 No petrol or paraffin tank of more than 2.5 litres (1/2 gallon) shall be installed within 1 metre (39^{1/2}ins) of any engine or heating appliance unless it is insulated and protected by an efficient baffle of fire resistant material.
- 2.8 Glass or plastic fuel sight tube gauges shall not be used. Fuel level indicators, if fitted, shall be of a type which does not allow escape of fuel or vapour in the event of damage to the indicator. Dipsticks when fitted shall be calibrated and only used via gas-tight fittings. Where a dipstick is used it must be made so it cannot strike the bottom of the tank. [see Exemption 11.4]
- 2.9 Fuel tanks shall be accessible and all connections shall be readily accessible for inspection.
- 2.10 Tanks shall be effectively bonded by low resistance metallic conductors of adequate strength to their deck filling connections, and in the case of a non-conducting deck or hull, tanks shall also be electrically bonded to an earth point in direct electrical contact with the surrounding water, for the discharge of static electricity.
- 2.11 Tanks may be drained only by a suitable drain valve fitted with a plug on the outlet. [see Exemption 11.5]
- 2.12 The fuel supply shall be drawn through the top of the tank or as near to the top of the tank as is practicable by means of an internal pipe extending to near the bottom of the tank. In the case only of gravity-feed systems a feed from a cock or valve directly screwed in near the bottom of the tank is permitted. Any return fuel line required to be connected to the fuel tank shall be connected through the top of the tank or as near to the top as is practicable. [see Exemption 11.6]
- 2.13 All fixed fuel feeds and pipes permanently charged with fuel shall be made of softened copper, stainless steel, aluminium alloy, or (for diesel installations only) mild steel of suitable size, fixed clear of exhaust systems and heating

apparatus and adequately supported to minimise vibration and strain. Balance pipes are only permitted in diesel fuelled installations. Any balance pipe between fuel tanks must comply with the requirements of this standard and must in addition be fitted with valves directly attached to the tank and so constructed that the valves will not become slack when operated. [see Exemption 11.7]

- 2.14 Flexible tubing may only be used in the engine compartment and shall be suitable for the fuel used. It shall be of minimum practicable length, be reinforced and have an internal diameter of not more than half its external diameter and shall have a fire resisting quality as required by BS EN ISO 7840 or DIN 4798.
- 2.15 All connections permanently charged with fuel shall be made with efficient screwed, compression, cone, brazed or flanged joints. Soft soldered joints shall not be used.
- 2.16 All fuel filters shall be suitable for marine use and shall be of fire resistant quality.
- 2.17 A cock or valve shall be fitted in the fuel feed pipe as near as possible to the fuel tank in a position where it is readily accessible. If it is not visible the position shall be clearly marked. In all petrol engine installations where the steering position is remote from the fuel tank a second cock or means of operating the main cock or valve close to the tank shall be fitted immediately accessible from the steering position.
- 2.18 Fuel pipes shall be installed above bilge water level.
- 2.19 Carburettors (other than of the down draught type) shall be fitted so as to allow any overflow there to drain into a spirit-tight metal drip tray the top of which shall be covered with copper or brass gauze of flame arresting mesh soldered to the tray all round. The tray shall be removable or be fitted with a cock for emptying. A flame trap or air filter must be fitted to the air intake of petrol, petrol and paraffin engines.
- 2.20 The engine shall be securely installed.
- 2.21 Every vessel shall have effective means of reversing operable from the steering position. The engine stop control shall be located as near to the steering position as is practicable. [see Exemption 11.8]
- 2.22 An oil-tight tray made of metal or other suitable material, the sides of which must be carried up as high as practicable, shall be fitted beneath

every engine and gearbox so as to prevent leakage of oil escaping into any part of the vessel or overboard. A tray is not required if oil-tight structural members are fitted fore and aft of the engine. No fixed bilge pump is to draw from the oil-tight area. [see Exemption 11.9]

- 2.23 The cylinders and exhaust system shall be effectively cooled and shall allow for the dissipation of heat. In the case of air-cooled engines or where water is not passed through the exhaust system the exhaust pipe silencer and flanges shall be effectively lagged or shielded.
- 2.24 Exhaust noise shall be effectively suppressed and no form of exhaust silencer cut-out shall be used.
- 2.25 In any steam powered engine installation:
 - i) pressure systems shall have a current inspection certificate issued by a Recognised Competent Person and shall be covered for third party risks by a current insurance policy.
 - ii) where the boiler is fuelled by liquefied petroleum gas, the gas installation shall comply with Part 7 of these Standards as applicable.
 - iii) where the boiler is fuelled by diesel, paraffin or similar fuels, the fuel installation shall comply with the appropriate requirements of Part 2 of these Standards as applicable.
 - iv) in the case of a dual fuel system no flame failure device is required so long as the boiler when in use is constantly attended.
- 2.26 All vessels with internal combustion engines fuelled by Liquefied Petroleum Gas (LPG) must comply with the Liquefied Petroleum Gas Association (LPGA) Code of Practice No.18 except that engine installations shall not be constructed to allow the use of a dual fuel system where LPG constitutes one of the fuels employed.

part 3 – electrical installation

The following standards apply to all vessels having electrical equipment.

(Note: There is in existence a Code of Practice which addresses Electrical and Electronic Installations in Boats published by the British Marine Electronics Association which includes reference to AC systems which may be referred to for further guidance).



- 3.1 All batteries shall be securely installed so as to prevent movement and damage. All battery compartments shall be adequately ventilated and covered with insulating and non-corrosive material. No battery may be fitted beneath or adjacent to any petrol or LPG tank, cylinder, cock, pipe or filter.
- 3.2 Cables shall be of adequate current carrying capacity and of suitable construction and grade. They shall be insulated and/or sheathed so as to be impervious to attack by fuel or water. They shall be adequately supported or run in adequately supported suitable conduit.
- 3.3 Main circuits shall be installed above bilge water level and all except starter circuits shall be protected by circuit breakers or fuses of the appropriate rating and of suitable design.
- 3.4 All cables shall be installed as high as is practicable in the vessel, and they shall be run clear of all sources of heat such as exhaust pipes. They shall not be run adjacent to fuel or gas pipes unless contained in suitable conduit. PVC insulated and/or sheathed cables shall not be run in direct contact with polystyrene thermal insulation. [see Exemption 11.10]
- 3.5 A battery master switch capable of disconnecting the system (including starter circuits) shall be installed in a readily accessible position as close to the battery as possible. The battery master switch must be capable of carrying the maximum current of the system. Electric bilge pumps, security alarms, fire pumps and electronic navigation equipment with memories when fitted may have circuits which bypass the master switch but only if separately protected by fuses or circuit breakers. If the battery master switch is not visible, its position must be clearly marked.
- 3.6 Main and starter motor leads subject to high current shall have soldered or pressure crimped connectors. Spark plug leads shall be supported clear of the engine block and cylinder head.
- 3.7 All electrical devices fitted in any compartment containing petrol or gas shall be ignition protected in accordance with BS EN 28846. [see Exemption 11.11]
- 3.8 All electrical equipment shall be two-wire insulated except in respect of engine circuits where there must be a low resistance return conductor between the battery and the engine. Engine installations with two wire insulated electrical systems do not require fitting of the low resistance return conductor.

- 3.9 The spark ignition and generating systems of engines and all electrical equipment on the vessel shall be effectively suppressed against causing radio and television interference.

part 4 – electrically propelled vessels

The following standards apply to all vessels having electrical propulsion.

- 4.1 The installation shall comply with the requirements of Part 3 of these standards insofar as they are applicable, and in all cases with the appropriate British Standards and with the Institution of Electrical Engineers (I.E.E.) Regulations for the Electrical and Electronic Equipment of Ships as appropriate to the size of the installation.
- 4.2 The arrangement of batteries, including in particular their stowage and the requirements in respect of adequate ventilation shall comply with the I.E.E. Regulations for the Electrical and Electronic Equipment of Ships – Section 14.
- 4.3 The propulsion motor shall be securely installed.
- 4.4 Every vessel shall have an effective means of reversing operable from the steering position.
- 4.5 A manually operated master switch which can be operated from the steering position shall be fitted. It shall be capable of cutting off the electrical supply to the propulsion motor.
- 4.6 The connection from the battery charger on board the vessel to the charging point ashore shall be by means of a 3 core flexible cable of adequate current carrying capacity and of suitable construction and grade, with connectors complying with the splash-proof category of BS EN 60309 Part 2.
- 4.7 The battery charging panel on the vessel shall be adequately ventilated and shall incorporate a positive switch and an indication light to show when charging of the vessel's batteries is taking place.
- 4.8 The battery charging arrangement shall incorporate control of the battery compartment exhaust ventilation fan, when fitted, such that the fan is automatically switched on when battery charging commences, and continues to run for one hour following the completion of charging.
- 4.9 The motor and controller compartments shall be adequately ventilated.

part 5 – outboard & portable engines

The following standards apply to all vessels fitted with or carrying outboard or portable engines whether in use or not.

- 5.1 All deck and fuel filling connections shall be situated so as to minimise the risk of cross-contamination and shall be clearly marked on the deck fittings or immediately beside them indicating the purpose of each connection and in the case of fuel connections the exact type of fuel.
- 5.2 Permanently installed fuel systems shall comply with Standards 2.1 to 2.19 inclusive and they and all associated pipework, cocks and fittings shall be suitably protected against external impact.
- 5.3 Portable fuel tanks, carried inboard and connected by flexible piping to the engine and close coupled fuel tanks forming an integral part of the engine may be used providing they are in sound condition and that the fuel supply can be readily shut off and no unauthorised modifications are made to the equipment as supplied by the manufacturers. Portable fuel tanks shall be clearly marked with the type of fuel to be used and when not in use shall be stowed in accordance with Standards 7.2 through to 7.8.
- 5.4 Petrol not carried in fuel tanks shall be stowed in containers conforming with the requirements of the Petroleum Spirit (Motor Vehicles etc.) Regulations 1929 (SR & O 1929/952) or the Petroleum Spirit (Plastic Containers) Regulations S.I. 1982 No. 630 and these shall be stowed in accordance with Standards 7.2 through to 7.8.
- 5.5 All vessels with engines fuelled by Liquefied Petroleum Gas (LPG) shall comply with the Liquefied Petroleum Gas Association (LPGA) Code of Practice No.18 except that engine installations shall not be constructed to allow the use of a dual fuel system where LPG constitutes one of the fuels employed.
- 5.6 Outboard engines shall be securely fitted.
- 5.7 Exhaust noise shall be effectively suppressed.
- 5.8 All portable LPG/petrol internal combustion engines/generators with integral fuel tanks when not in use shall be stowed in accordance with the requirements of Standards 7.2 through to 7.8. Portable diesel internal combustion

engines or generators shall be stored securely when not in use.

part 6 – fire prevention & extinguishing equipment

- 6.1 Powered vessels or vessels carrying or fitted with cooking, heating, refrigerating or lighting appliances shall be equipped with not less than the number of portable extinguishers detailed below, which shall be of a type approved by the BSI and/or the British Approvals of Fire Equipment scheme. Extinguishers shall be kept in readily accessible positions adjacent to fire risk points, and shall be properly maintained in good condition for immediate use. Any portable extinguisher provided for the protection of an engine space shall be capable of being discharged without fully opening the primary access.

MINIMUM LENGTH OF VESSEL	MINIMUM NUMBER OF EXTINGUISHERS	MINIMUM FIRE RATING OF EACH EXTINGUISHER	COMBINED FIRE RATING EXTINGUISHERS
Up to 7m (23ft)	2	5A/34B	10A/68B
7m-11m (23-36ft)	2	5A/34B	13A/89B
Over 11m (36ft)	3	5A/34B	21A/144B

The number of extinguishers may be reduced by one fire extinguisher with a fire rating of no more than 5A/34B where either:

- i) no cooking, heating, refrigerating, lighting or fuel-burning appliances are carried; or
- ii) no engine is installed

(Note: Fire extinguishers which have been manufactured to comply with EN3 and are certified and marked as such by a Certifying Authority and are marked with the fire rating will be considered as acceptable as those which carry the BS kitemark). [see Exemption 11.12]

- 6.2 Any fixed system installed for the protection of a fire risk space shall be in addition to the portable extinguishers required by Standard 6.1 and if remotely operated the release device shall be readily accessible from outside that space.
- 6.3 In vessels fitted with cooking facilities, a fire blanket marked as complying with at least the "light duty" requirements of BS 6575, or BS EN

1869 ready for immediate use, shall be kept nearby [see Exemption 11.13]

- 6.4 In vessels with hulls constructed of glass-fibre reinforced plastic (GRP) those areas of high fire risk, such as an engine room or fuel compartment, shall have any exposed GRP structure coated with a suitable fire retardant material complying with the Class 2 requirements of BS 476: Part 7. [see Exemption 11.14]
- 6.5 Polystyrene thermal insulation shall comply with the Type A requirements of BS 3837: Part 1. [see Exemption 11.15]
- 6.6 All soft furnishings, fabrics, and foam materials used in the lining out and furnishing vessels shall be of suitable fire resistant materials, which on combustion release minimal amounts of toxic products. Upholstery fabrics used shall satisfy the cigarette and butane flame tests of BS EN 1021 Parts 1 and 2. [see Exemption 11.16]
- 6.7 All vessels shall have two means of escape from accommodation areas. All means of escape shall have a minimum clear opening of 0.2m² (310in²) and a minimum width of 380mm (15ins). [see Exemption 11.17]

for guidance only

The fire rating of an extinguisher appears as a series of numbers and letters marked on the side eg 5A/34B. The numbers relate to the ability of the extinguisher to successfully put out a fire under test conditions. The bigger the numbers, the bigger the fire on which the extinguisher has been tested.

CLASS OF FIRE	EXTINGUISHING MEDIUM	COLOUR OF EXTINGUISHER
A	Water	Signal red
A/B	Foam	Pale cream
A/B/C	Powder	French blue
B/C	CO ₂	Black

where:

CLASS A fire = paper, wood, textiles and fabric

CLASS B fire = flammable liquids

CLASS C fire = flammable gases

NB: In the event of an electrical fire use dry powder or CO₂ ONLY

It should be noted that:

- i) All stored pressure ABC dry powder extinguishers have a Class A/Class B fire rating.
- ii) All stored pressure BC dry powder and CO₂ extinguishers only have a Class B fire rating.
- iii) Most, but not all, aqueous film forming foam (AFFF) extinguishers have a Class A/Class B fire rating. Some small capacity AFFF extinguishers only have a Class B rating.
- iv) CO₂ extinguishers are not to be provided for living spaces.
- v) Halon extinguishers may be retained until life-expired or discharged.
- vi) The number of extinguishers and the total and individual fire ratings (which are marked on all approved extinguishers) depend on the vessel size, engines (whether inboard or outboard), and installation of L.P.G. or other fuel burning appliances.
- vii) Fire buckets with lanyards, where provided, shall be in addition to the extinguishers required.

part 7 – LPG (liquefied petroleum gas) installations

The following standards shall apply to all vessels with LPG installations.

(Note 1: Guidance on the design considerations when installing, modifying or adding to LPG systems and information regarding the testing of LPG installations is contained within BS 5482-3 and the Boat Safety Scheme Technical Manual).

(Note 2: any work on LPG systems should only be carried out by competent persons).

- 7.1 The installation shall comply with BS 5482 – Code of practice for domestic butane and propane gas-burning installations, Part 3: Installations in boats, yachts and other vessels. (NOTE: The provision for existing installations contained within Annex A of BS 5482-3 is represented by paragraphs 11.18 and 11.19 and 11.22 to 11.29)
- 7.2 Every cylinder (full or empty, stored or in use) shall be either:
- i) secured on open deck, cabin tops or outside cockpits so that any leakage flows overboard. Cylinders, low pressure

regulators and associated equipment shall be at least 1 m away from hatches, other openings and possible sources of ignition. (NOTE: Cylinders, low pressure regulators and associated equipment may be enclosed in a shelter on open deck, cabin tops or outside of cockpits provided the shelter conforms to this sub-paragraph 7.2 i); or

- ii) secured in a cylinder locker LPG-tight to the hull interior at least to the level of the cylinders, low pressure regulators and associated equipment. Cylinder lockers shall only be openable from the top and shall be provided with a lid or cover to protect cylinders, low pressure regulators and associated equipment from mechanical damage. Cylinder lockers shall be ventilated from outside the vessel to a point above the level of the cylinders.
(NOTE 1: see paragraph 11.18).

A means to drain LPG away from the vessel shall be provided from the lowest point of the cylinder locker to a point outside the hull above the deepest loaded waterline.

(NOTE 2: see paragraph 11.19).

(NOTE 3: Cylinders may be secured in a cylinder housing in a self-draining cockpit provided the installation is in accordance with Standard 7.7).

- 7.3 All cylinders shall be installed in an upright position with the valve uppermost and secured so that no damage can occur to the cylinders, regulators, hoses or pipework. Cylinders, cylinder lockers or cylinder housings shall not form an obstruction for persons moving about the deck or walkway or interfere with the normal operation of the vessel. Cylinders, cylinder lockers or cylinder housings shall not be located near to heat sources. All cylinders shall be accessible and removable in an emergency.
- 7.4 Cylinder lockers or cylinder housings shall be constructed of metal of thickness at least 0.9 mm, with welded or brazed joints, or of fibre reinforced plastics (FRP) of minimum thickness 5 mm, or of materials having a fire resistance of 30 min in accordance with BS 476-20.
- 7.5 Cylinder locker or cylinder housing drain pipes, hoses and connections shall be of a material suitable for use with LPG and hoses shall be connected in accordance with Standard 7.13. Drains shall have an internal diameter of at least 19 mm (3/4ins).

(NOTE: see paragraph 11.22).

- 7.6 The opening into a cylinder locker or cylinder housing shall enable the operation of valves, replacement of cylinders, and access to connections or regulating devices. The opening into a cylinder locker shall not be situated in an accommodation space, engine space, fuel space or battery space.
(NOTE: see paragraph 11.23 (i)).
- 7.7 Cylinder housings may open from the side into self-draining cockpits provided that:
 - i) the drain outlets from the self-draining cockpit are above the deepest loaded waterline; and
 - ii) the design of the craft ensures the self-draining cockpit is LPG tight to the interior of the vessel at least to the height of the LPG cylinders, low pressure regulators and associated equipment.
(NOTE: The height of the bridge deck, or any fixed cill to an accommodation space shall be at least to the height specified); and
 - iii) any hatches or openings within the self-draining cockpit are watertight; and
 - iv) cylinder housings conform to the ventilating and draining requirements of Standard 7.2 and Standards 7.3, 7.4, 7.5, 7.6, and 7.8.

7.8 Cylinder lockers or cylinder housings shall not contain any items that could damage the low pressure regulator(s) or associated pipework, or obstruct the drain or ignite leaked LPG.

- 7.9 A readily accessible main shut-off valve situated outside the accommodation space shall be fitted and installed as close to the LPG cylinder(s) as practicable.
(NOTE see paragraph 11.23 (ii)).

The valve of any LPG cylinder or of a connected low pressure regulator may be used as the main shut-off except where two or more LPG cylinders are connected by an automatic changeover device. Where an automatic changeover device is fitted the main shut-off valve shall be situated as close to the outlet of the device as practicable. If the main shut-off valve is not in a clearly visible position or is in a space that can be closed off by doors or lids, then its position shall be clearly marked. If there is more than one main shut-off valve, this and the locations of the other main shut-off valves shall be clearly marked on or adjacent to each valve.

- 7.10** All high pressure stage components shall be installed on the open deck or cabin tops or outside cockpits, or in a cylinder locker or cylinder housing if there is one. If two or more cylinders are connected, each high pressure stage connection shall be protected by a non-return valve. High pressure stage components not directly attached to the cylinder valve shall be connected by a pre-assembled length of flexible hose conforming to type 2 of BS 3212, fitted with integral threaded metallic ends. The hose shall be of the minimum practicable length to allow for the replacement of cylinders and shall not exceed 1m. High pressure stage components not directly attached to the cylinder valve shall be secured in a position that provides protection from mechanical damage and protects vent holes from the ingress of debris or water. External manual-adjustment type regulators shall not be fitted.
- 7.11** The inlet gas connection on installation pipework shall be securely fixed and readily accessible. For cylinders stowed below decks or in cockpits, the inlet gas connection shall be situated inside the cylinder locker or cylinder housing. Installation pipework from cylinder lockers shall either be from a bulkhead fitting or above the level of the cylinder, low pressure regulator and associated equipment.
- 7.12** Installation pipework shall be made of either:
- i) seamless copper tube conforming to BS EN 1057 with copper or copper alloy compression fittings; or
 - ii) stainless steel tube, of a grade suitable for use with LPG and a marine environment with appropriate compression or screwed fitting, or
 - iii) copper nickel alloy, of a grade suitable for use with LPG and a marine environment with appropriate compression or screwed fittings.
- (NOTE 1: Flexible hose conforming to Standard 7.13 may be used as the appliance connector to a gimbaled cooking appliance, or to an appliance that requires movement for hygienic purposes.)
(NOTE 2: If only a cooking appliance is installed, flexible hose may be used to connect it to the low pressure regulator, provided the length does not exceed 1 m.)
- 7.13** Flexible hose shall conform to type 2 of BS 3212. Flexible hose shall be of the minimum practicable length, not exceeding 1m, and shall be readily accessible. Flexible hose shall be installed without stress or tight radius turns and hose passing through bulkheads, partitions, deck-heads, or decks shall be protected from abrasion. For low pressure applications, flexible hose shall be a pre-assembled length fitted with integral threaded metallic ends, or secured to nozzles by a metal crimped clip or worm drive hose clamp. Hose clamps fixed by spring tension shall not be used. Hose clips and clamps shall be of the correct size for the hose and at least 8mm in width. Flexible hose shall not be used where it could be subjected to temperatures above 50°C.
- 7.14** Flexible hose conforming to Standard 7.13 shall be used as the appliance connector between portable appliances and their isolation valves. Flexible hose shall be connected to the isolation valves by means of a bayonet, plug-in or screwed connection. Pipework to portable appliances fitted with a screwed connection shall be properly plugged or capped when the appliance is not connected.
- 7.15** Self-contained portable gas appliances having the burner screwed direct to the cylinder or container shall be stored in a cylinder locker or cylinder housing when not in use. Self-contained portable gas appliances shall not be used whilst unattended on board any vessel.
- 7.16** Installation pipework shall be accessible, run as short as practicable particularly between the cylinder(s) and the highest rated appliance(s) and be as high as practicable within the hull, preferably at gunwale level. Pipework shall be rigidly secured with fixing clips spaced no more than 500 mm apart. Pipework shall be routed, or otherwise protected, to minimise the possibility of damage and where pipework penetrates bulkheads or walls it shall be protected from damage by sleeves, grommets or bulkhead fittings.
- 7.17** Installation pipework shall not run below bilge water level or in contact with any material that could cause corrosion. Pipework shall not pass through petrol engine spaces or spaces dedicated to electrical equipment (including batteries), unless jointless and enclosed in a gas-proof conduit.
- 7.18** Installation pipework shall not pass through ventilation or air conditioning ducts and shall not be exposed to leakage from water services. Installation pipework shall be remote and/or

insulated from, and shall not pass through the same duct as, electricity or telecommunication services and shall be separated from electrical cables not in a conduit by at least 30 mm. Installation pipework shall not be situated less than 75 mm from exhaust pipes.

- 7.19** Joints shall be made with compression fittings. (NOTE: For stainless steel and copper alloy pipework screwed fittings are acceptable).

Soldered joints shall not be used. Joints shall be readily accessible. Joints shall be rigidly secured and fixing clips shall be attached no more than 150 mm from each joint connection. Joints shall be made at a point where stress is minimised. The number of pipe fittings and joints shall be kept to a minimum.

- 7.20** Appliance isolation valves shall be installed in the supply line to each appliance, including portable appliances, and shall be readily accessible.

(NOTE 1: see paragraph 11.24.)

(NOTE 2: if there is only one appliance the main shut-off valve is sufficient unless the appliance is a portable appliance)

- 7.21** Appliance isolation valves not situated immediately adjacent to appliances shall clearly indicate which appliance they serve. If valves operate by rotation, closing shall be clockwise. "Open" and "closed" positions shall be clearly marked on or adjacent to all valves. Tapered plug valves shall be spring loaded. Needle valves shall not be used. Valves at floor level shall be located to prevent inadvertent operation, or shall be of the drop fan or loose key type. Pipework to appliances permanently removed or removed for servicing shall be properly plugged or capped. Isolation valves alone shall not be used for this purpose.

- 7.22** A means to determine the gas system is sound shall be fitted by either having:

- i) a readily accessible test point on appliances where a test gauge may be attached without dismantling any part of the appliance with the use of tools; or
- ii) a readily accessible approved test point fitted in the pipework; or
- iii) a bubble tester installed in the cylinder locker.

(NOTE 1: Information regarding the tests employed to check the soundness of a gas

system is contained within BS 5482-3 and the Boat Safety Scheme Technical Manual).

(NOTE 2: Operators of hire/charter vessels and houseboats are reminded that they are subject to the Gas Safety (Installation and Use) Regulations which deal with safe installation, maintenance and use of gas systems).

part 8 – appliances, flueing & ventilation

The following standards apply to all vessels fitted with cooking, heating, refrigerating and lighting appliances.

(Note 1: Appliances should be recommended by the manufacturers as suitable for use in a marine environment).

(Note 2: Appliances should be installed and maintained in accordance with manufacturer's instructions).

(Note 3: All fires, cookers and other appliances with naked lights must be turned off and automatic ignition systems disabled before taking in fuel).

- 8.1** The fuel installation to each appliance shall be in accordance with the appropriate parts of these Standards.

- 8.2** LPG Appliances shall be room sealed with the exception of cooking appliances. (NOTE: see paragraph 11.25).

LPG appliances shall include a test fitting.

(NOTE: see paragraph 11.26).

A satisfactory flame picture shall be present at each appliance burner when all appliance burners in the system are operating at maximum rate.

- 8.3** Appliances shall be properly installed and in accordance with the manufacturer's recommendations for installation in vessels. Appliances shall be secured against accidental movement and connected so that there is no undue stress on pipework and fittings. Pipework shall not be used to retain the appliance. LPG and fuel oil appliances shall not be installed in petrol engine spaces. Appliances shall be situated in sufficient space, as instructed by the manufacturer, to prevent overheating of nearby surfaces. (NOTE: see paragraph 11.27).

- 8.4** Cooking appliances (and gimbals, if fitted) shall be securely installed. Gimballed cooking

appliances shall be secure at all angles of heel. Materials in the vicinity of cooking appliances shall be non-combustible or protected with a finish of class 1 surface spread of flame rating as specified in BS 476-7. Combustible materials and materials without a class 1 surface spread of flame rating shall not be placed within the following distances of cooking appliances:
(NOTE: see paragraph 11.28)

- i) 400 mm above the cooking appliance, for horizontal surfaces when the vessel is upright;
- ii) 200 mm above the cooking appliance, for horizontal surfaces when the vessel is heeled to 30°;
- iii) 125 mm horizontally from the cooking appliance, for vertical surfaces.

Curtains and other suspended textile materials shall not be fitted within 600 mm of a cooking appliance.

(NOTE: see paragraph 11.28)

- 8.5** Appliance burners, ignition burners and pilot lights shall be fitted with flame supervision devices that completely close the LPG or fuel oil supply.
(NOTE: see paragraph 11.29)
- 8.6** The water inlet to any instantaneous water heater shall be piped only from the vessel's cold water system.
- 8.7** Fuel oil appliances shall have a valve or cock to shut off the fuel supply in a readily accessible position within the same compartment as, but at a safe distance from, the appliance(s).
- 8.8** Flue components on room sealed appliances, including ductwork and terminals, shall be installed in accordance with the appliance manufacturer's recommendations for installations in vessels. Flue terminals and air inlets shall not be positioned within 500 mm of a ventilator, opening port, hatch, window, refuelling fitting, or fuel tank vent outlet. Flues and flue terminals shall ensure safe transfer of gases to outside the vessel, away from areas that could be enclosed by canopies and in a position that minimises the risk of accidental damage.
(NOTE 1: Information regarding the test employed to check the effectiveness of any flue is contained within BS 5482-3 and the Boat Safety Scheme Technical Manual).

(NOTE 2: The flueing arrangements on existing appliances are covered in paragraph 11.25(v)).

- 8.9** Adequate fixed ventilation shall be provided in accordance with the requirements of BS 5482-3 in vessels in which LPG or other fuel appliances are used.
(NOTE: Ventilators should be weathertight to cater for the worst conditions likely to be encountered. Vessels which regularly proceed to sea and would likely experience severe weather conditions may have ventilators which can be closed to prevent the ingress of water in such conditions).

On sea going vessels equipped with closeable ventilators a warning notice shall be attached on or near to all non-room sealed appliances. The wording of the notice should state:

"WARNING – Open ventilator(s) before use"

part 9 – pollution

- 9.1** No sanitation system capable of discharging sewage overboard shall be fitted in any vessel unless it is capable of being sealed or rendered inoperable. Sanitation systems shall comply with the requirements of BS MA 101.
[see paragraph 11.20]

part 10 – hire boats and safety features

In addition to the standards specified in Parts 1 – 9 inclusive where applicable, all boats which are let out for hire or reward and new boats not covered by the EC directive shall comply with the following additional requirements.

- 10.1** At least one lifebuoy shall be carried on each vessel in a readily accessible position.
- 10.2** Where there are walkways, handrails of adequate strength shall be fitted where practicable for the full length of all cabin tops, or guard-rails shall be fitted around the perimeter of the deck.
- 10.3** Every opening in the hull of a vessel above the normal laden water-line (including those used as intakes or outlets for air for engine cooling purposes) shall be so positioned that its lowest point is not less than 250mm (10 ins) above the normal laden water-line of the vessel, unless such openings are permanently and securely connected to ducts or pipes which are watertight up to that level.

- i) Self draining cockpits are not required to comply with the 250mm height requirement of this Standard so long as effective arrangements are made to minimise the ingress of water into other parts of the hull by incorporation of non return valves in the drains and/or by provision of bulkhead(s) or cill(s) to a height of 150mm.
 - ii) A weed hatch if fitted shall have a cover at least 150mm (6ins) above the normal laden water-line and shall be watertight when secured.
- 10.4** Every opening in the hull of a vessel below the normal laden water-line provided for use as an intake for water shall be fitted with an adequate valve or cock directly adjacent to it and be readily accessible for immediate use.
- 10.5** Instructions prohibiting the blocking of ventilators shall be inscribed on permanent labels prominently displayed on board the vessel.
- 10.6** All port lights, side scuttles, windows, and interior glass partitions shall be safety glass to BS 952 Part 1 or of suitable acrylic or polycarbonate material. [see paragraph 11.21]
- 10.7** Unpowered hotel boats not carrying fuel nor fitted with cooking, heating, refrigerating or lighting appliances shall comply with the requirements of Standard 6.1 as if they were a powered vessel.
- 10.8** All manually propelled vessels or sailing vessels not carrying fuel nor fitted with cooking, heating, refrigerating, or lighting appliances are not required to comply with the standards as defined.

part 11 – exemptions

In all cases of boat refitting whether this be in whole or in part the opportunity should be taken to bring exempted installations or equipment up to the requirements specified under Parts 1 to 10 inclusive.

- 11.1** Vessels manufactured prior to 16 June 1998 and having a fuel filling pipe of an internal diameter of at least 32mm (1¹/₄ins) are not required to comply with that part of Standard 2.2 which requires that a fuel filling pipe shall have an internal diameter of at least 38mm (1¹/₂ins).
- 11.2** Vessels manufactured prior to 16 June 1998 and having a vent pipe of an internal diameter of at least 9.5mm (3/₈ins) are not required to

comply with that part of Standard 2.4 which requires that a vent pipe shall have an internal diameter of at least 12mm (1/₂ins). In the case of vessels manufactured prior to 16 June 1998 having no vent pipe, a vent in the screwcap or filling pipe above deck level may be fitted provided that there is a flame arrester complying with the requirements of Standard 2.5. The flame arrester shall have a minimum diameter of 12mm.

- 11.3** Vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 2.6 which requires that fuel tanks must have sustained a pressure test of 0.25kgf/cm² (3.5lbf/in²) before installation and be marked to indicate this.
- 11.4** Any diesel fuelled vessel formerly used for the commercial carriage of freight or passengers or as a tug or as an icebreaker and which is to be licenced for use as a pleasure boat, commercial carrying vessel or registered for use as a houseboat unless used for the purposes of hire or reward shall not be required to comply with Standard 2.8.
- 11.5** Vessels manufactured prior to 16 June 1998 and having a fuel tank drain without a valve are not required to comply with that part of Standard 2.11 which requires that fuel tanks shall have a suitable drain valve fitted with a plug on the outlet.
- 11.6** Diesel fuelled vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 2.12 which requires that the fuel supply and return pipes shall be taken through the top of the tank or as near to the top of the tank as is practicable.
- 11.7** Diesel fuelled vessels manufactured prior to 16 June 1998 and fitted with a balance pipe between close coupled tanks are not required to comply with that part of Standard 2.13 which requires valves to be fitted where it is not practicable to do so.
- 11.8** Vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 2.21 which requires effective means of reversing.
- 11.9** Vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 2.22 which requires an oil-tight tray made of metal or other suitable material, the sides of which must be carried as high as practicable where it is not practicable to comply

without the removal of the engine. This exemption will be rescinded on 16 June 2000 or the first Boat Safety Certificate examination after this date.

- 11.10** Vessels manufactured prior to 16 June 1998 and having PVC insulated or sheathed cables in direct contact with polystyrene thermal insulation are not required to comply with that part of Standard 3.4 which requires that PVC cables shall not run in direct contact with polystyrene thermal insulation until such time that an insulation resistance test discloses an electrical fault in cables in direct contact with polystyrene thermal insulation.
- 11.11** Vessels manufactured prior to 16 June 1998 are not required to comply with Standard 3.7 which requires that all electrical devices fitted in any compartment containing petrol or gas shall be ignition protected in accordance with BS EN 28846 where it is not practicable to comply. The exemption will be rescinded at some future date by amendment.
- 11.12** Vessels manufactured prior to 16 June 1998 and complying with the navigation authority's previous requirements for fire extinguishers are not required to comply with that part of Standard 6.1 which prescribes a minimum fire rating for each extinguisher and a minimum combined fire rating until such time as the existing extinguishers are life expired or discharged.
- 11.13** Vessels manufactured prior to 16 June 1998 and carrying a fire blanket in good condition are not required to comply with that part of Standard 6.3 which prescribes that fire blankets shall comply with at least the 'light duty' requirements of BS 6575. This exemption will be rescinded on 16 June 2000 or the first Boat Safety Certificate examination after this date.
- 11.14** Vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 6.4 which requires exposed GRP structure to be coated with suitable fire retardant material complying with the Class 2 requirements of BS 476: Part 7 until such time as visual inspection of the exposed GRP structure shows deterioration.
- 11.15** Vessels manufactured prior to 16 June 1998 are not required to comply with the requirements Standard 6.5.
- 11.16** Vessels manufactured prior to 16 June 1998 are not required to comply with the requirements Standard 6.6.
- 11.17** Vessels manufactured prior to 16 June 1998 are not required to comply with the requirements Standard 6.7 where it is not practicable to modify the structure to provide two means of escape.
- 11.18** Apart from hire cruisers licensed with the Broads Authority, vessels manufactured prior to 3 January 2000 are not required to comply with that part of Standard 7.2(ii) which requires cylinder lockers to be ventilated from outside the vessel to a point above the level of the cylinders.
- 11.19** Vessels manufactured prior to 3 January 2000 and having a cylinder locker drain as near as practicable to the bottom of the cylinder locker are not required to comply with that part of Standard 7.2(ii) which requires the drain to be provided from the lowest point of the cylinder locker.
- 11.20** Vessels manufactured prior to 16 June 1998 are not required to comply with that part of Standard 9.1 which requires that sanitation systems shall comply with the requirements of BS MA 101.
- 11.21** Vessels manufactured prior to 16 June 1998 are not required to comply with the requirements of Standard 10.6 which requires safety glass to BS 952 Part 1 or suitable acrylic or polycarbonate material to be fitted providing that all existing vessels with non safety glass are protected by the use of suitable stick on film by 16 June 2000 or the first Boat Safety Certificate examination after this date.
- 11.22** Vessels manufactured prior to 3 January 2000 and having an LPG drain with a minimum internal diameter of 12mm for a cylinder of up to 15kg capacity and which is enlarged proportionally for additional LPG storage, are not required to comply with that part of Standard 7.5 which requires the drain to have an internal diameter of at least 19mm (³/₄ins).
- 11.23** Vessels manufactured prior to 3 January 2000 that were designed and constructed with a cylinder locker within the hull of the vessel, but outside engine, fuel or battery spaces, are not required to comply with:
- i) that part of Standard 7.6 which requires that the opening into a cylinder locker shall not be sited in an accommodation space provided the cylinder locker is located in a low risk position; and

- ii) that part of Standard 7.9 which requires the main shut-off valve to be fitted outside the accommodation space.

11.24 Vessels manufactured prior to 3 January 2000 are not required to comply with the requirements of Standard 7.20 unless the appliance is connected with flexible hose.

11.25 Vessels manufactured prior to 3 January 2000 and having non-room sealed appliances are not required to comply with that part of Standard 8.2 which requires LPG appliances, with the exception of cooking appliances, to be room sealed provided the following requirements are complied with:

- i) Replacements for existing non-room sealed appliances, with the exception of cooking appliances, shall be room sealed and installed in accordance with BS 5482-3 and Parts 7 and 8 of these Standards as appropriate.
- ii) Modifications or additions to an existing installation shall be performed in accordance with the appliance manufacturer's recommendations.
- iii) Pilot lights and burners on LPG or paraffin refrigerators installed in vessels with a petrol engine shall be completely enclosed. Combustion air and combustion products shall be drawn and exhausted through a suitable flame trap, or combustion air piped to the appliance from outside the vessel or from a point inside the vessel above the level of the windows, other openings, or other means of ventilation in the accommodation space.
- iv) Catalytic type appliances shall conform to BS 5258-11 or BS EN 449.
- v) The flues and draught diverters of existing appliances shall be of a type approved by the manufacturer, and properly fitted and maintained. Flues shall be of suitable material, effectively insulated, and of appropriate internal diameter to ensure safe transfer of gases to outside the vessel, away from areas that could be enclosed by canopies. Appliances designed for use exclusively with a flue, or draught diverter and flue, shall have one fitted. Only the flue supplied or recommended by the manufacturer shall be used with refrigerators flued to the outside

(Note 1: Information regarding the test employed to check the effectiveness of any flue is contained within BS 5482-3 and the Boat Safety Scheme Manual).

11.26 Vessels manufactured prior to 3 January 2000 are not required to comply with that part of Standard 8.2 which requires LPG appliances to include a test fitting.

11.27 Vessels manufactured prior to 3 January 2000 and having woodwork and all other combustible materials including curtains adjacent to all appliances suitably insulated and protected against excessive heat or inherently flame retardant, or treated with a durable flame retardant are not required to comply with that part of Standard 8.3 which requires appliances to be situated in sufficient space, as instructed by the manufacturer, to prevent overheating of nearby surfaces.

11.28 Vessels manufactured prior to 3 January 2000 and having woodwork and all other combustible materials including curtains adjacent to all appliances suitably insulated and protected against excessive heat or inherently flame retardant, or treated with a durable flame retardant are not required to comply with the distance measurements applied to combustible materials and materials without a class 1 surface spread of flame rating, or the distance measurements applied to curtains and other suspended textile materials, in Standard 8.4.

11.29 Vessels manufactured prior to 3 January 2000 are not required to comply with Standard 8.5 which requires a flame supervision device to be fitted to all appliance burners provided that such devices are fitted to all:

- catalytic type appliances
- appliances with a pilot light
- appliances with a continuously burning flame

contacts

Further information on the Boat Safety Scheme is available from:

Boat Safety Scheme, Willow Grange, Church Road, WATFORD WD17 4QA.

Tel: 01923 201278 Fax: 01923 201420

Navigation authority contacts:

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Tel: 01923 201120 Fax: 01923 201300

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Environment Agency – Thames Region PO Box 214, READING, RG1 8DQ.

Tel: 0118 9535650 Fax: 0118 9574165 www.environment-agency.gov.uk

Environment Agency – Anglian Region Aqua House East Station Road
PETERBOROUGH PE2 8AA

Tel: 01733 371811 Fax: 01733 464892

Environment Agency – Southern Region Orchard House, Endeavour Park,
London Road, Addington, WEST MAULING, Kent, ME19 5SH.

Tel: 01732 875587 Fax: 01732 875057

Latest versions of relevant British Standards are available from:

British Standards Institution Customer Services Sales Department, 389 Chiswick
High Road, LONDON W4 4AL

Tel: 020 8996 9001 Fax: 0208 996 7001 www.bsi-global.com

The British Marine Electronic Association (BMEA) Code of Practice for Electrical and
Electronic Installations in Boats, is available from:

British Marine Industries Federation, Meadlake Place, Thorpe Lea Road,
EGHAM, Surrey TW20 8HE, Tel: 01784 223600 Fax: 01784 439678

www.marinedata.co.uk/bmif

Information concerning gas engineers competent in marine installations is available from:
The Council for Registered Gas Installers (CORGI), 1 Elmwood, Chineham Business
Park, Crockford Lane, BASINGSTOKE Hants, RG24 8WG
Tel: 01256 372200 Fax: 01256 708144 www.corgi-gas.com

The LPG Code of Practice No.18. Recommendations for the safe use of LPG as a
propulsion fuel for boats, yachts and other craft, is available from:
LP Gas Association, Pavilion 16, Salisbury Road, RINGWOOD Hampshire, BH24 3PB
Tel: 01425 461612 Fax: 01425 471131 www.lpga.co.uk

A useful leaflet entitled 'LPG (Bottled Gas) for Marine Use, is available from:
Calor Gas, Calor Customer Support Centre, Athena Drive, Tachbrook Park, WARWICK,
CV34 6RL. Tel: 01926 330088 www.calorgas.co.uk

Information on steam powered craft is available from:
Steam Boat Association of Great Britain, www.steamboat.org.uk

Information on electrically propelled boats is available from:
Electric Boat Association, www.electric-boat-association.org.uk
