SCHEDULE 4

LIFERAFTS

Schedule 4, Part 1

PART VIII

GAS INFLATION SYSTEM

General

1.

1.1. The component parts of the gas inflation system shall be constructed with proper workmanship and materials.

1.2. The capacity of the gas charge shall be sufficient to achieve full working pressure in a liferaft within 1 minute at an ambient temperature of 18–20°C, and within 3 minutes at a temperature of −30°C.

1.3. The inflation system shall be fitted with a pressure relief arrangement capable at a temperature of +65°C of exhausting sufficient capacity of gas to prevent damage to a liferaft through overpressure.

1.4. The inflation system shall provide sufficient pressure to enable a liferaft to maintain its form when loaded with a full complement of persons and equipment.

1.5. Activation of the inflation system shall be capable of being carried out by one person with a single action.

1.6. The gas cylinder, valve, and operating head shall be fitted on the outside of a liferaft.

1.7. The inflation system shall not be damaged in stowage and shall operate in a satisfactory manner throughout the air temperature range −30°C to +65°C.

1.8. The inflation system shall operate in a satisfactory manner throughout a seawater temperature of −1°C to +30°C.

1.9. The gas cylinder, cylinder valve, and operating head shall be constructed with compatible materials, which are suitable for use in a marine environment.

1.10. Gas cylinders, cylinder valves, and operating heads of aluminium alloy shall not be accepted unless they have been tested in salt water to the satisfaction of the Department of Transport.

Gas

2.

2.1. The gas used in the inflation system shall be non-toxic.

2.2. It shall provide a high rate of inflation, and shall be sufficiently free from icing at the outlet during expansion to prevent damage or malfunction of the inflation equipment.

2.3. If the gas used is carbon dioxide its dryness shall comply with TYPE 1, SECTION 1 of British Standard 4105.

2.4. The filling ratio (weight of gas to the weight of water required to fill a cylinder at 15°C) shall comply with the requirements of British Standard BS 5355.

2.5. The excess gas from the relief valves must not be discharged into the liferaft.

Gas Cylinders

3.

3.1. The gas cylinder shall be acceptable to the Department of Transport and must be constructed to the standard laid down in the relevant part of British Standard 5045: Specification for Transportable Gas Containers.

3.2. The gas cylinder shall be periodically inspected, tested, and maintained in accordance with the relevant part of British Standard 5430.

3.3. Recharging of the gas cylinder shall be carried out at a filling station acceptable to the Department of Transport.

3.4. The neck of the gas cylinder shall be suitably threaded to take an approved type of cylinder valve.

3.5. If the gas used is carbon dioxide the gas passages to give maximum rate of flow must not permit expansion, and a siphoning tube shall be led from the cylinder valve into the cylinder so that the open end is immersed in liquid when the cylinder is in its operational position.

3.6. To allow for variation in the accuracy of scales a tolerance in the gross mass of ± 14 grams is permissible when a gas cylinder is check weighed.

3.7. Charged gas cylinders with a gas capacity of 1.1 kg or greater when check weighed shall not be deficient in gas by more than 56 grams. Charged cylinders with a gas content of less than 1.1 kg shall not be deficient in gas by more than 28 grams.

3.8. The gas cylinder shall be permanently marked with:

(3.8.1) date of manufacture, serial number, and name or mark of the manufacturer;

(3.8.2) standard or specification to which it is manufactured;

(3.8.3) date of testing and test pressure;

(3.8.4) tare mass of cylinder, and valve; and

(3.8.5) minimum designed water capacity in litres.

3.9. The gas cyclinder after charging shall be clearly stencilled with:

(3.9.1) tare mass;

(3.9.2) details of gas charge; and

(3.9.3) total mass of cylinder, valve and contents.

Gas Cylinder Valve

4.

4.1. The cylinder valve shall be fitted with a safety relief device which will operate between 18 MPa and the test pressure of the cylinder.

4.2. Threads on the cylinder valve for attachment of the high pressure hoses and operating head shall be fitted with protective caps to provide protection during storage and transit.

4.3. A cylinder valve constructed from aluminium alloy shall be anodised.

4.4. The cylinder valve when attached to an approved gas cylinder and operationally charged shall be capable of being stowed for a period of 17 months without damage, metal fatigue, or leakage making due allowance for changes in temperature.

4.5. The cylinder valve shall be constructed of materials which will not be damaged by inflation of the liferaft, transit in a liferaft container, or routine servicing in a service station.

Gas Cylinder Operating Head

5.

5.1. The connection between the operating head and the liferaft painter shall be so arranged that the load is wholly taken by the operating mechanism until the valve has operated. When the valve has fully opened the load on the painter shall be transferred to the liferaft towing patch or bridle.

5.2. The operating head at a cylinder pressure of 8.6 MPa shall fully open with a force not exceeding 150 newtons and a travel of not more than 200 mm at an ambient temperature of 18–20°C.

5.3. The operating head shall be fitted with a positive means of retaining the valve in the open position and include an indicator which will clearly show whether or not the valve has been operated.

5.4. Attachment of the operating head to the gas cylinder shall be arranged so that there will be no tendency during fitting to slacken the cylinder valve.

5.5. The operating head shall be made from non-corrodible materials.

5.6. An operating head constructed from aluminium alloy shall be anodised.

5.7. If a pulley arrangement is used in the operating mechanism the cable shall be protected with a flexible conduit to prevent kinking of the cable, and abrasive damage to the liferaft fabric.

5.8. The operating head shall be sealed against the ingress of water.

High Pressure Hose Assembly

6.

6.1. A high pressure hose shall be used to connect the gas bottle to the liferaft inlet manifold on the buoyancy chambers.

6.2. It shall be constructed of natural or synthetic rubber or other suitable material having a smooth bore and some form of reinforcement.

6.3. It shall be fitted with end connectors of sufficient strength to withstand a degree of over tightening acceptable to the Department of Transport.

6.4. Where nipples are inserted into the ends of the hose they shall be suitably shaped to prevent damage or abrasion to the inner lining, and provide a smooth gas flow.

6.5. The outer casing of the hose shall be suitably protected against damage or abrasion.

6.6. The hose shall have a minimum bursting pressure of 21 MPa at an ambient temperature 18–20°C and 4.2 MPa at a temperature of −45°C.

6.7. The hose shall operate in a satisfactory manner throughout an air temperature range of −45°C to +65°C.

6.8. The hose shall be capable of being bent through 180 degrees over a former of 50 mm radius at a temperature of −45°C without cracking or damage.

6.9. The hose shall not distort or be damaged when subjected to a hydraulic pressure of 12.5 MPa.

6.10. Every hose shall be carefully inspected and marked by the manufacturer's quality inspector.

6.11. The hose shall be marked externally with:

(6.11.1) name of manufacturer;

(6.11.2) part or serial number;

(6.11.3) test date; and

(6.11.4) mark of inspector.

Valves

7.

7.1. Non-return valves shall be provided at each position where gas from the inflation system enters an inflatable chamber either from the cylinder or another chamber.

7.2. A safety relief valve of sufficient flow capacity that it will not be possible to achieve twice the working pressure in the chamber shall be fitted to each chamber inflated directly from the gas cylinder.

7.3. A relief valve shall re-seat at a pressure sufficient to maintain rigidity in the buoyancy tubes.

7.4. An inlet valve shall be fitted to each chamber inflated directly from the gas cylinder to provide a means of topping up the pressure when necessary using the bellows provided in the equipment pack.

7.5. Deflation valves or plugs shall be fitted of sufficient number to enable the inflated chambers of the liferaft to be deflated for re-packing.

7.6. Non-return valves or other equivalent arrangements shall be fitted to prevent loss of pressure in the canopy support if either of the buoyancy tubes become damaged.

7.7. An inlet valve for topping up the pressure when necessary using the bellows provided in the liferaft equipment pack shall be fitted in the inflated arch support for the canopy.

7.8. An inlet valve shall be fitted to the floor so that it can be inflated using the bellows provided in the equipment pack.

7.9. A deflation valve or plug shall be fitted to the floor so that it can be deflated for re-packing.

7.10. A non return valve or other equivalent arrangement shall be fitted to maintain pressure in the buoyancy tube in the event of damage to the boarding ramp.

7.11. Air aspirators if fitted in the inflation system shall be of a type acceptable to the Department of Transport. They shall be suitably protected against damage and the ingress of water.