SCHEDULE 1

ESSENTIAL SAFETY REQUIREMENTS

PART 1

MATERIALS

1. Materials must be selected according to the intended use of the vessels and in accordance with the following provisions of this Part.

Pressurised components

2. The non-alloy quality steel, non-alloy aluminium or non-age hardening aluminimum alloy used to manufacture the pressurised components must:

— be capable of being welded;

— be ductile and tough, so that a rupture at the minimum working temperature does not give rise to either fragmentation or brittle-type fracture; and

— not be adversely affected by ageing.

— For steel vessels, the materials must in addition meet the requirements set out in paragraph 3 below and, for aluminium or aluminium alloy vessels, those set out in paragraph 4 below. They must be accompanied by an inspection slip.

Steel vessels

3. Non-alloy quality steels must meet the following requirements:

(a) they must be non-effervescent and be supplied after normalisation treatment, or in an equivalent state;

(b) the content per product of carbon must be less than 0.25% and that of sulphur and phosphorus must each be less than 0.05%; and

(c) they must have the following mechanical properties per product:

— the maximum tensile strength must be less than 580 Newtons per square millimetre (N/mm

— the elongation after rupture must be:

• if the test piece is taken parallel to the direction of rolling:

thickness – 3mm: A – 22%

thickness A – 17%

• if the test piece is taken perpendicular to the direction of rolling:

thickness – 3mm: A – 20%

thickness A – 15%; and

— the average rupture energy for three longitudinal test pieces at the minimum working temperature must not be less than 35 Joules per square centimetre (J/cm Not more than one of the three figures may be less than 35 J/cm with a minimum of 25 J/cm

In the case of steels used to manufacture vessels whose minimum working temperature is lower than minus 10° C and whose wall thickness exceeds 5 millimetres, the average rupture energy must be checked.

Aluminium vessels

4. Non-alloy aluminium must have an aluminium content of at least 99.5% and non-age hardening aluminium alloys must display adequate resistance to intercrystalline corrosion at the maximum working temperature. Moreover these materials must meet the following requirements:

(a) they must be supplied in an annealed state; and

(b) they must have the following mechanical properties per product:

— the maximum tensile strength must be no more than 350 N/mm and

— the elongation after rupture must be:

— A – 16% if the test piece is taken parallel to the direction of rolling

— A – 14% if the test piece is taken perpendicular to the direction of rolling.

Welding materials

5. The welding materials used to make the welds on or of the vessel must be appropriate to and compatible with the materials to be welded.

Accessories contributing to the strength of the vessel

6. These accessories (bolts, nuts etc) must be made either of a material specified in paragraphs 2 to 4 above or of another kind of steel, aluminium or aluminium alloy which:

— is appropriate to and compatible with the materials used to manufacture the pressurised components; and

— at the minimum working temperature has an appropriate elongation after rupture and toughness.

Non-pressurised components

7. All welded non-pressurised components must be of a material which is compatible with that of the parts to which they are welded.