

**CODE OF PRACTICE**  
**FOR**  
**HONG KONG LPG INDUSTRY**

**MODULE 3**

**Handling and Transport of LPG**  
**in Bulk by Road**

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# Module 3 Handling and Transport of LPG in Bulk by Road

## Contents

	<b>Page</b>
<b>PREFACE</b>	
<b>SECTION 1 INTERPRETATION OF TERMS</b>	<b>1</b>
<b>SECTION 2 OBJECTIVES &amp; SCOPE</b>	<b>4</b>
2.1 Objectives	4
2.2 Scope	4
2.3 Regulations and References	4
<b>SECTION 3 VEHICLE DESIGN</b>	<b>8</b>
3.1 Engine and Related Systems	8
3.2 Electrical Systems	9
3.3 Side Protection	11
3.4 Rear End Protection	12
3.5 Vehicle Stability	12
3.6 Driver's Cab	12
3.7 Drive-away Prevention	12
3.8 Fire Resisting Shield	12
3.9 Anti-static Provision	13
3.10 Material of Construction	13
<b>SECTION 4 VESSEL DESIGN AND CONSTRUCTION</b>	<b>14</b>
4.1 New Construction	14
4.2 Remounted Vessels	16
4.3 Mountings	17
4.4 External Corrosion Protection	17
4.5 Fire Proof Coating	17
4.6 Valves and Fittings	17
4.7 Pipework and Ancillary Equipment	20
4.8 Electrostatic Earth Provision	25
<b>SECTION 5 COMMISSIONING, TESTING AND EXAMINATION</b>	<b>26</b>
5.1 General	26
5.2 Documentation and Records	26
5.3 Initial Testing and Inspection during Construction	27
5.4 Commissioning Inspection	28
5.5 Annual Testing and Examination	30
5.6 Five Yearly Revalidation of LPG System	31
5.7 Accident Damage	32
5.8 Purging into Service	33
5.9 Purging out of Service	35

<b>SECTION 6</b>	<b>MAINTENANCE AND REPAIR</b>	<b>37</b>
6.1	General	37
6.2	Documentation and Records	37
6.3	Maintenance Workshop and Personnel	37
6.4	LPG System	38
6.5	Alterations to Road Tanker	39
<b>SECTION 7</b>	<b>HAZARD WARNING PANELS AND LABELS</b>	<b>40</b>
<b>SECTION 8</b>	<b>OPERATIONAL REQUIREMENTS</b>	<b>41</b>
8.1	Only Competent Persons to be Employed on Road Tankers	41
8.2	Information to be Carried on a Road Tanker	42
8.3	Special Precautions Against Fire and Explosion	42
8.4	Certain Equipment to be Carried on a Road Tanker	42
8.5	Loading and Unloading Operations	43
8.6	Emergency Tanker to Tanker Product Transfer	46
8.7	Parking and Supervision of Vehicles	47
8.8	Report of Gas Emergency	47
8.9	Change of Ownership	48

## **APPENDICES**

<b>A</b>	Relevant Sections in Relation to the Gas Safety (Gas Supply) Regulations
<b>B</b>	Specification for Selecting Fire Proof Coating for LPG Vessel on Road Tankers
<b>C</b>	A List of Recommended Designations in English and Chinese for LPG Piping Systems on Road Tankers
<b>D</b>	Syllabus of Training for Drivers and Attendants of LPG Road Tankers
<b>E</b>	HAZCHEM Code Plate
<b>F</b>	Transport Emergency Card for LPG Road Tankers
<b>G</b>	Typical Road Tanker Diagrams
<b>H</b>	Guidelines for Administering Alcohol Tests on Competent Persons Employed on LPG Road Tankers
<b>I</b>	Records of Competent Person Employed on LPG Road Tanker - Form 113, Form 113 Annex and Form 114

## PREFACE

This document is the third in a series of modules as Code of Practice for the LPG industry in Hong Kong. The other 7 modules are :

- Module 1      LPG Compounds and Cylinder Stores
- Module 2      Underground LPG Pipework
- Module 4      Aboveground Distribution Pipes, Service Risers, Downers and Ring Mains
- Module 5      Domestic Installations
- Module 6      Non-Domestic Installations
- Module 7      Operating Procedures for Emergencies for LPG Compounds and Piped-cylinder Stores
- Module 8      Operating Procedures for Emergencies for Installations outside LPG Compounds/Stores.

Module 3 lays down recommended practice for the guidance of those involved in the transport of LPG in bulk by road in Hong Kong. This module shall be read in conjunction with the Gas Safety Ordinance (Cap. 51) and subsidiary regulations (See Appendix A for reference).

The basis for development of this document is the Standard Practice Manuals prepared by Congas (Volume 1 & 2), the Code of Practice by the LP Gas Association in U.K., the safety requirements issued by the Gas Standards Office and the Fire Services Department in Hong Kong.

This module has been prepared jointly by the Gas Standards Office and the LPG industry.

While this module tends to be specific in important aspects affecting safety and reliability, it shall be seen as offering guidance to engineers, operators and other users who will continue to exercise judgement and skill in the fulfilment of their obligations. It shall be borne in mind that practice may need changes with emerging technology and experience and the requirements listed in this document shall not be regarded as a set of rigid guidelines that cannot be changed. It is expected that the document will be reviewed and updated as required.

## SECTION 1 INTERPRETATION OF TERMS

**Bulk tank** - A receptacle with a water capacity of more than 450 litres and used, or to be used, to contain liquefied petroleum gas.

**Compression ignition engine** - A compression ignition engine within the meaning of the Road Traffic (Construction and Maintenance of Vehicles) Regulations (Cap. 374 sub. Leg.)

**Competent person** - A person who is competent by virtue of his/her training and substantial practical experience to perform/supervise/inspect LPG installation, testing and maintenance works.

**Listed competent person** - A person who meets the acceptance criteria as listed in form EMSD/GSO/101 and, upon application to Gas Standards Office, is assessed as fully competent to inspect/certify LPG installation, testing and maintenance work.

**Listed competent person employed on road tankers** - A person who meets the acceptance criteria as listed in form EMSD/GSO/113 in Appendix I and, upon application to Gas Standards Office, is assessed as fully competent to carry out operation in relation to the use of road tanker; and the loading into or discharge from a road tanker of LPG.

**Equipment** - In relation to a gas vehicle, includes fittings and accessories.

**Excess-flow valve** - A device designed to close when the liquid or vapour passing through it exceeds a prescribed flow rate.

**Fire safe valve** - A fire safe valve means a valve which can comply with an acceptable fire test and can substantially retain fluid under specified temperature conditions. BS 6755 and API 607 give guidelines on fire test for valves

**Fixed maximum level device** - A device fitted to a tank for the purpose of ascertaining whether the amount of liquefied petroleum gas in the tank is more than the safe filling capacity of the tank.

**Flame resistant material** - A material that is not readily ignitable and does not readily propagate flame.

**Gas Authority** - The authority appointed under Section 5 of the Gas Safety Ordinance (Cap. 51).

**Gas Standards Office (GasSO)** - An office within government which is under the control of the Gas Authority to administer the Gas Safety Ordinance.

**Hot work** - Welding or the use of any flame or electric arc or the use of any equipment likely to cause heat, flame or spark. It also includes caulking, chipping, drilling, riveting and any other heat producing operation, unless it is carried out in such a way as keep the temperature of the tools and work below 100°C.

**In bulk** - In relation to liquefied petroleum gas, means the containment of any amount of such gas in a vessel which has a water capacity of more than 150 litres.

**Intrinsically safe** - Confining electrical energy to the installed system so that a hazardous environment cannot be ignited; and protecting the integrity of the circuit from intrusion of energy from other electrical sources so that the safe energy limitation in the circuit is not exceeded, even when breaking, shorting or earthing of the circuit occurs.

**Loading** - Transferring LPG from terminal bulk storage to road tanker

**LPG** - Liquefied petroleum gas as defined under the Gas Safety Ordinance (Cap. 51)

**LPG compound** - A bulk LPG storage installation with bulk tanks or mini-tanks as receptacles, including vaporisers, pressure regulators, piping systems and tanker bay.

**Mini-tank** - A receptacle with a water capacity of more than 150 litres but not more than 450 litres; and used or to be used, to contain liquefied petroleum gas.

**Motor vehicle** - A motor vehicle within the meaning of the Road Traffic Ordinance (Cap. 374).

**Notifiable gas installation (NGI)** - An installation, as defined in Section 2 of the Gas Safety Ordinance (Cap. 51).

**Owner** - In relation to a road tanker, means the owner within the meaning of the Road Traffic Ordinance (Cap. 374) of such road tanker.

**Overall height** - Overall height within the meaning of the Road Traffic (Construction and Maintenance of Vehicles) Regulations (Cap. 374 sub. Leg.)

**Permit** - A permit issued under regulation 26 of the Gas safety (Gas Supply) Regulations in respect of a gas vehicle.

**Piping system** - A system made up of pipes, tubings, valves and fittings, etc. for conveying LPG in either liquid or vapour state at various pressures from one point to another.

**Pressure relief valve** - A valve designed for preventing a rise of internal pressure in excess of a specified value due to emergency or abnormal conditions.

**Purging** - Replacing the content in a system by a different medium before putting it into or out of service.

**Remounted vessel** - A used vessel which has been dismantled from an existing road tanker and is re-installed to another chassis.

**Registered Gas Supply Company (RGSC)** - A gas supply company registered by the Gas Authority which as a business (a) imports, (b) manufactures or (c) supplies any gas.

**Road** - A road within the meaning of the Road Traffic Ordinance (Cap. 374).

**Road tanker** - A motor vehicle designed and constructed for the conveyance of LPG in bulk on roads.

**Safe area (non-hazardous area)** - An area in which a flammable gas mixture is not expected to be present in quantities such as to require special precautions for the construction, installation and use of electrical apparatus.

**Source of ignition** - Material, devices or equipment which, because of their modes of use or operation, are capable of providing sufficient thermal energy to ignite a flammable gas mixture when in contact with them.

**Tank** - A bulk tank or mini tank.

**Tanker bay** - An area of the LPG compound where a road tanker is parked during unloading operations.

**Transport** - In relation to LPG, means the conveyance of such gas by a road tanker.

**Unloading** - Transferring LPG from a road tanker to a static storage installation

**Use** - In relation to a motor vehicle, includes drive.

**Vessel** - In relation to a road tanker, means that part of the tanker which is used to contain liquefied petroleum gas in bulk.

**Water capacity** - The amount of water in volumetric units at 15.6°C required to fill a container completely.

## 2 OBJECTIVES & SCOPE

### 2.1 Objectives

This Module has been prepared as a general outline of basic safety standards to be followed by owners of road tankers so as to ensure, in carrying on their business, the health and safety at work of their employees and to conduct their operations in a safe manner so that members of the public are not exposed to undue risks from gas.

### 2.2 Scope

2.2.1 This Module covers the design, construction, inspection, testing, operation and maintenance of LPG road tankers. It encompasses vessel, vehicle design, valves, fittings, pipework, electrical systems, electrical equipment, fire protection, operational requirements, etc.

2.2.2 This Module applies only to road tankers with a maximum carrying capacity of 9 tonnes of LPG.

2.2.3 This Module does not cover:

- a) Cylinder wagons
- b) Maintenance of road tanker mechanics, e.g. engine, transmission, gearbox, etc.

2.2.4 The design and construction requirements in this Module shall, unless specified otherwise, apply to new road tankers and existing road tankers at their next 5-yearly revalidation of LPG system. The operation and maintenance aspects shall apply to all new and existing road tankers.

**Note:** SI units shall be used for new road tankers. Other units are also permitted with SI unit in brackets.

### 2.3 Regulations and References

2.3.1 All road tankers shall comply with local statutory safety requirements. Particular reference shall be made to:

Gas Safety Ordinance (Cap. 51)

Gas Safety (Gas Quality) Regulations (Cap. 51)

Gas Safety (Gas Supply) Regulations (Cap. 51)

Gas Safety (Registration of Gas Supply Companies) Regulations (Cap. 51)

Road Traffic Ordinance (Cap. 374)

Dangerous Goods Ordinance (Cap. 295)



Fire Services Ordinance (Cap. 95)

2.3.2 This Module makes reference to the following publications (latest editions of these publications shall be used in each case):

**ANSI/ASME - American National Standards Institute/American Society of Mechanical Engineers**

ANSI/ASME Boiler & Pressure Vessel Code Section VIII - Pressure vessels

ASME B1.5 ACME screw threads

ANSI B16.5, Piped flanges and flange fittings, steel nickel alloy and other special alloys

**ANSI/ASTM - American National Standards Institute/American Society for Testing & Materials**

ASTM A53, Specification for pipe, steel, black and hot-dipped, zinc-coated welded and seamless

**API - American Petroleum Institute**

API 607, Fire Test for Soft-Seated Quarter-Turn Valves

**AS - Australian Standard**

AS 1210, SAA Unfired Pressure Vessel Codes

**BSI - British Standards Institute**

BS 470, Specification for inspection, access and entry opening for pressure vessels

BS 476, Fire tests on building materials & structures

BS 1560, Circular flanges for pipes, valves and fittings

BS 1600, Specification for dimensions of steel pipe for the petroleum industry

BS 1965, Specification for butt-welding pipe fittings for pressure containing purposes

BS 3381, Specification for spiral wound gaskets for steel flanges to BS 1560

BS 3601, Specification for carbon steel pipes and tubes with specified room temperature properties for pressure purposes

BS 3799, Specification for steel pipe fittings, screwed and socket-welding for the petroleum industry

BS 3951, Part 2 Section 2.3, Specification and testing of series 1 freight containers. Tank containers for liquids, gases and pressurized dry bulk

BS 4089, Specification for metallic hose assemblies for liquid petroleum gases and liquefied natural gases

BS 4882, Specification for bolting for flanges and pressure containing purposes

BS 5345, Code of Practice for the selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres

BS 5423, Specification for portable fire extinguishers

BS 5490, IEC 60529, Specification for classification of degrees of protection provided by enclosures

BS 5500, Specification for unfired fusion welded pressure vessels

BS 5501, Electrical apparatus for potentially explosive atmospheres

BS 6501, Part 1 - Specification for corrugated hose assemblies

BS 6755, Testing of valves

BS 6862, Specification for cables for vehicles

BS 7122, Specification for welded steel tanks for the road transport of liquefiable gases

### **IP - Institute of Petroleum**

Code of Practice Part 1, Electrical

DOC - 1.92.1 Recommendation for Safe Use of Radio Telephone Installations In the Cabs of Petroleum Carrying Vehicles

### **LPGA - Liquefied Petroleum Gas Association, UK (formerly LPGITA - Liquefied Petroleum Gas Industry Technical Association)**

No.1 Part 1, Design, Installation and Maintenance of Bulk Storage at Fixed Installations

No. 2, Safe Handling and Transport of LPG in Road Tankers and Tank Containers by Road

No.7, Storage of Full and Empty LPG Cylinders and Cartridges

No. 14, Hoses for the transfer of LPG in bulk, Installation, Inspection, Testing & Maintenance

No. 15, Valves and Fittings for LPG Service

No.17, Purging LPG Vessels and Systems

No.22, LPG Piping System - Design and Installation

**NACE - National Association of Corrosion Engineers**

RP-01-69, Control of External Corrosion on Underground or Submerged Metallic Piping Systems

RP-0285, Control of External Corrosion on Metallic Buried, Partially Buried or Submerged Liquid Storage Systems

**NFPA - National Fire Protection Association**

NFPA 58, LP Gas Storage, Use

### **3 VEHICLE DESIGN**

**Note:** This Section shall be read in conjunction with "Road Traffic Ordinance Cap. 374"

#### **3.1 Engine and Related Systems**

##### **3.1.1 Type of Road Tanker**

The LPG vessel shall be either an integral part of the chassis of the vehicle or securely and permanently attached to it. Articulated vehicles with vessel mounted on the trailer are not permitted.

##### **3.1.2 Engine**

3.1.2.1 In accordance with item 9(a), Part I, Schedule 2 of Gas Safety (Gas Supply) Regulations, the engine shall be of the compression ignition type.

3.1.2.2 In accordance with item 11, Part I, Schedule 2 of Gas Safety (Gas Supply) Regulations, a means of cutting off the supply of fuel to the engine and stopping that engine shall be provided to the engine of the road tanker. This shall be provided in the position which is:

- a) outside the cab of the road tanker;
- b) easily accessible; and
- c) identified, in English and Chinese, by a notice prominently and legibly stating "EMERGENCY ENGINE STOP 緊急停車掣".

3.1.2.3 In accordance with item 9(c), Part I, Schedule 2 of Gas Safety (Gas Supply) Regulations, the engine shall be constructed and so situated so as to avoid any danger to any liquefied petroleum gas carried by the tanker through heating or ignition. This provision will be deemed to be met if the engine is placed forward of the front wall of the vessel.

##### **3.1.3 Air Inlet System**

3.1.3.1 The air inlet system shall be placed forward of the fire resisting shield separating the vessel and its associated pipework from the engine.

3.1.3.2 The air inlet system shall be provided with an appropriate device which prevents over-running of the engine to destruction.

3.1.3.3 An air filter with metallic mesh shall be used to prevent flame propagation due to engine back fire.

### **3.1.4 Exhaust System**

The exhaust system should be placed forward of the fire resisting shield separating the vessel and its associated pipework from the engine and should not extend beyond the vehicle body. The exhaust pipe outlet shall be directed outwards from the vehicle.

A flame arrestor shall be incorporated into the exhaust system.

### **3.1.5 Fuel Tank**

3.1.5.1 In accordance with item 10, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the fuel tank shall be:

- a) of double case construction;
- b) fitted with a lock to the filling hole cover;
- c) so placed that, in the event of a leak from the tank, fuel can only drain to the ground without impinging on the engine or its exhaust system; this provision is deemed to be met if four holes of 10mm diameter are provided at the four bottom corners of the outer case;
- d) separated from the cab of the road tanker; and
- e) suitably protected against impact.

3.1.5.2 The fuel tank shall be suitably protected by a robust steel structure against mechanical impact. The steel structure shall be separated from the fuel tank by at least 25mm

## **3.2 Electrical Systems**

3.2.1 In accordance with item 12, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the electrical system shall be designed, installed and adequately protected to minimise mechanical damage and the risk of short circuit and electrical fires.

3.2.2 The nominal circuit voltage of any circuit on the vehicle shall not exceed 24 volts. All control switches shall be in the feed side of the circuit.

In accordance with item 13, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, all electrical apparatus which is in any enclosed area of the road tanker where an accumulation of liquefied petroleum gas may occur shall be suitable for use in Zone 1 areas as defined in BS 5354. Enclosed area includes pipework cabinet and tool box.

In accordance with item 14, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, all electrical apparatus which is not in any enclosed area of the road tanker but is not more than 750 millimetres distant from the vessel of the tanker,

or any pressure valve, fixed liquid level gauge, vapour return connection, loading or draw-off connection, or other opening to the vessel, shall be suitable for use in Zone 2 areas as defined in BS 5354.

- 3.2.3 All cables shall have copper conductors (except for the heavy duty cable from the battery to the starter motor which may be in aluminium provided compression terminations are used), and shall be insulated and further covered in accordance with the requirements of BS 6862. Except for cables to the starter motor, the current rating of any cable shall be chosen such that the conductor temperature shall not exceed 70°C when it is carrying full load continuously at a maximum ambient temperature of 40°C.
- 3.2.4 Batteries shall be fitted in an electrical insulating battery box to effectively protect it against spillage of LPG and to prevent contact with objects which could cause a spark.
- 3.2.5 All wiring behind the drivers cab shall run in a conduit of metal tubing. Electrical connections should not be exposed.
- 3.2.6 Behind the rear of the vehicle cab:
- a) no capless lamp-bulbs shall be used.
  - b) junction boxes, connectors and all electrical equipment shall be adequately protected and shielded from the ingress of moisture or LPG and the degree of protection shall be at least that classified as IP 55 in accordance with BS 5490.
  - c) switches shall be suitable for use in Zone 2 areas as defined in BS 5345.
- 3.2.7 Either an insulated return circuit shall be used or every piece of electrical apparatus on the vehicle shall be individually bonded by cable to the chassis or a structural member attached to the chassis.
- 3.2.8 A master switch to Zone 2 requirements, as defined in BS 5345: Part 1 & 2 to enable all electrical circuits to be isolated (including open circuiting of the alternator field windings), shall be placed as near as possible to the battery. The switch shall have contacts capable of achieving physical separation for isolation purposes to the requirements of BS 5501: Part 1 and BS 5501: Part 7. This shall not prevent intrinsically safe circuits or flameproof circuits to Zone 1 requirements, as defined in BS 5345: Parts 1 & 2 from being taken from the battery side of the master switch. The master switch control shall be readily accessible to persons outside the vehicle and its location shall be indicated by a clearly visible and legible notice in both Chinese and English languages. Means must also be provided to enable the driver to open the switch without leaving his seat. Visual means shall be provided to indicate clearly when the master switch is in the “ON” or “OFF” position.
- 3.2.9 Where the electrical apparatus, which is isolated by the battery master switch, is fitted with back-up or built-in power sources, an assessment shall be made to

ensure that under a one-fault condition, it is not capable of igniting a leak of LPG. (For guidance see BS 5501: Part 1 and BS 5501: Part 5, or BS 5501: Part 7)

3.2.10 The electricity master switch shall be capable of isolating the air conditioner.

### **3.2.11 Circuit Protection**

3.2.11.1 The following steps shall also be taken to ensure protection of the electrical circuits.

- a) All circuits, with the exception of the main battery supply and the starter and alternator circuits, shall be protected with fuses or circuit breakers in the feed side of each circuit.
- b) All circuit protective devices, with the exception of any barrier device for a tachograph or other intrinsically safe device, shall be mounted forward of the rear of the cab.
- c) Fuses or circuit breakers shall be fitted within an enclosed unit and fuse holders shall be permanently marked with the maximum fuse rating.
- d) The number of circuits connected to any protective device shall not exceed four, and the rating of the device shall be compatible with the smallest conductor in any of these circuits.
- e) Any fuse type circuit protective device shall be designed to open circuit within 10 seconds when passing a current equal to 200% of its normal rating in accordance with BS 2950. For a thermal circuit breaker, the trip time at 200% of its normal rating shall not exceed 30 seconds.
- f) Grouping of circuits shall be so arranged that the failure of a minor circuit does not render a major or obligatory circuit inoperative.

### **3.2.12 Other Electrical Equipment**

3.2.12.1 Cigar/cigarette lighters and power plug points in cab shall be dismantled or properly sealed.

3.2.12.2 Radios or radio telephones must be permanently wired into a double pole circuit which can be isolated via the master switch. The transceiver and converter shall comply with the Institute of Petroleum Specification DOC - 1.92.1.

### **3.3 Side Protection**

3.3.1 Side guards shall be fitted in accordance with Regulation 40A of the Road Traffic (Construction & Maintenance of Vehicles) Regulations (Cap. 374 sub. Leg.). See also 4.7.2.9 and 4.7.2.10.

### **3.4 Rear End Protection**

3.4.1 In addition to the requirement in the Road Traffic (Construction and Maintenance of Vehicles) Regulations (Cap. 374 sub. Leg.), the vehicle shall be provided with a rear bumper designed to provide protection for the vessel and any rear mounted ancillary equipment in the event of a rear end collision. The width of the bumper shall not be less than the width of vessel, see also 4.7.2.10. The inside face of the bumper shall be located at least 100mm from the rear of the vessel or any LPG fittings.

### **3.5 Vehicle Stability**

3.5.1 The height of the centre of gravity of the laden vehicle shall not be greater than 95% of the distance between the outer walls of the supporting tyres measured to the outside of their contact with the ground.

**Note:** The owner of vehicle shall demonstrate compliance of 3.5.1 by providing relevant calculations on the vehicle weight distribution.

3.5.2 The road tanker shall not be more than 4.1 metres in overall height.

### **3.6 Driver's Cab**

3.6.1 Where windows are provided at the back of the cab they shall be of at least 6mm thick toughened or safety glass and be retained internally and externally with fire resisting framing or clips. They must not be capable of being opened.

3.6.2 There shall be no opening in the cab roof. If any roof vents are fitted they must be sealed and not capable of being opened.

### **3.7 Drive-away Prevention**

3.7.1 Means shall be provided to ensure automatic immobilisation of the vehicle whilst transfer hoses are connected to a road tanker or a receiving vessel, and until they are properly stowed.

3.7.2 The system shall be designed to prevent inadvertent actuation of the braking system while the vehicle is in motion. A manual override system shall also be available for prompt release of the braking system in emergency.

### **3.8 Fire Resisting Shield**

3.8.1 In accordance with item 6(d), Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the vessel of the road tanker shall:

- (a) be effectively screened with fire-resisting shields from:
  - (i) the interior of the cab;
  - (ii) the fuel tank;
  - (iii) the electrical generator;
  - (iv) the engine;



- (v) the batteries, switch gear and fuses; and
- (vi) the engine exhaust system, of the road tanker.

(b) be located not less than 150 millimetres distant from the nearest part of the fire-resisting shield which screens the interior of the cab of the tanker in accordance with item 6(e), Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, or from the nearest part of the driver's cab in the case referred to in 3.8.4.

3.8.2 The shield referred to in 3.8.1(a)(i) shall project upward to a point above the topmost level of the vessel; and downwards to a point not more than 300mm from the ground. Also, it shall be of the same width as the vehicle chassis.

3.8.3 The shield shall provide at least 30 minutes fire resistance rating (steel plate of at least 3mm thick).

3.8.4 Any aperture made to allow piping to pass through the shield(s) shall be so sealed as to prevent the passage of flammable vapour through the shield.

3.8.5 The requirement in 3.8.1 (a)(i) will be deemed to be met if the shell of the cab shall be constructed of fire resisting materials which have a surface spread of flame characteristic not inferior to that of class 2 in BS 476: Part 7; and

The shell of the cab shall not collapse or permit the penetration of flame for a period of 15 minutes when tested in accordance with BS 476: Parts 20 and 22.

### **3.9 Anti-static Provision**

Tyres should be of anti-static type with an electrical resistance which complies with BS 2050.

### **3.10 Material of Construction**

3.10.1 In accordance with item 3, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the body, chassis and fuel tank of the road tanker and all equipment shall be constructed of non-combustible material. Equipment covers vessel and its associated pipework.

3.10.2 In accordance with item 4, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, any combustible material used in the construction of the road tanker shall be flame resistant.

## 4 VESSEL DESIGN AND CONSTRUCTION

### 4.1 New Construction

4.1.1 Maximum carrying capacity of the vessel is limited to 9 tonnes of LPG, above which requires special considerations of the Authority.

**Note:** A vessel with water capacity of 19 kilolitres corresponds to a maximum carrying capacity of around 9 tonnes of LPG taking into account the ullage requirement in 4.7.5.3 (a).

4.1.2 The maximum carrying capacity of an LPG vessel is also determined by the limitations of the maximum safe volume of LPG which may be carried in the vessel and/or the overriding statutory limitations of maximum gross laden weight (GLW) and individual axle weights permitted on roads. See also 4.7.5.3.

4.1.3 The maximum overall width of any vessel and its service equipment shall be such that it does not project beyond the overall width of the rest of the vehicle.

4.1.4 New vessels shall be designed, constructed, heat treated, inspected and tested to an internationally recognised standard such as BS 7122 (category 1 of BS 5500) or ASME Boiler & Pressure Vessel Code Section VIII, and the requirements of this Code of Practice (CoP). The use of partial standard will not be allowed.

**Note:** Advice may be sought from the Authority on the interpretation of the recommendations of this CoP in case there exists any doubt in relation to the co-application of this CoP and the pressure vessel code employed.

4.1.5 The vessel shall be provided with a minimum of 1mm additional wall thickness for corrosion allowance.

4.1.6 The design temperature shall be  $-10^{\circ}\text{C}$  to  $50^{\circ}\text{C}$ .

4.1.7 The design of new vessels shall be based on a vapour pressure of at least 1.725 MPa.

An additional allowance shall be made for the acceleration forces specified in 4.1.9. For remounted vessels constructed before this Code of Practice, see 4.2.

4.1.8 In allowing for static loads, in addition to self weight, and the weight of LPG to be carried, consideration must be given to initial and subsequent hydraulic test when the contents may be water. Where the vessel is to be self-supporting, vessel design must provide for the additional stresses normally carried by the vehicle chassis frame.

4.1.9 In accordance with item 6(a), Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the design pressure of the vessel shall include an allowance to accommodate stress due to horizontal and vertical acceleration and retardation likely to be encountered in operation. This provision will be deemed to be met by multiplying the static loads by the following factors in calculating the design pressure:

in the direction of travel	x2
in the vertical downwards direction	x2
in the transverse horizontal direction	x1

- 4.1.10 Vessel apertures shall be formed from machined or forged connections and provided with studs for flanged fittings, or female taper threads for taper-to-taper threaded fittings. Pressure relief valves may require protection around the connection against mechanical impact, e.g. shrouds. See 4.6.4.4.
- 4.1.11 Threaded connections shall not exceed 80mm nominal bore. See also 4.7.2.4.
- 4.1.12 Records of vessel shall be kept and updated for the service life of the vessels and shall include the followings:
- a) detailed design drawings including nozzle arrangements and fittings;
  - b) steel plate mill certificates;
  - c) weld test reports;
  - d) welder's certificates;
  - e) manufacturer's certificate of compliance; and
  - f) all test and inspection certificates
- 4.1.13 Internal pipework which may be required for liquid fill, spray fill, vapour balance, meter vapour eliminator, pressure gauge, fixed or rotary liquid level gauges shall comply with the following clauses.
- a) All internal joints shall be tested to ensure they are leak tight.
  - b) Adequate supports shall be provided to resist vibration and acceleration forces associated with road transport and other dynamic forces such as vessel flexing which may otherwise cause fatigue failure.
  - c) The location of pipework shall not interfere with access for internal inspection through the manway or through internal baffles.
- 4.1.14 A corrosion resistant data plate shall be firmly attached to one of the supporting structures or welded to the vessel, in a clearly visible position and shall be stamped with the following information:
- a) Manufacturer's name
  - b) Pressure test date
  - c) Design code

- d) Hydraulic test pressure
- e) Design pressure
- f) Design temperature range
- g) Water capacity
- h) Tank serial number
- i) Inspecting authority mark

The characters shall not be less than 5mm high. Extra space shall be provided for subsequent stamping of re-test dates.

4.1.15 In accordance with item 6(b), Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, vessels with an internal volume of over 5m<sup>3</sup> (5000 litres) shall be fitted with baffle plates set laterally to limit longitudinal surge. They shall be designed to facilitate access through them for purposes of internal inspection of the tank.

4.1.16 Vessels over 5m<sup>3</sup> (5000 litres) volume shall have a manhole of diameter not less than 460mm. Access through baffles shall be by openings not less than 460mm diameter. Vessels up to and including 5m<sup>3</sup> capacity shall have inspection apertures complying with BS 470. The manhole shall not be located at the front end of the vessel.

## **4.2 Remounted Vessels**

4.2.1 An LPG vessel constructed before the issue of this Code of Practice may be reused and remounted provided the requirements of 4.2.2 to 4.2.8 are met. All equipment, pipework and fittings shall comply with this Code of Practice.

4.2.2 The vessel shall have been designed and constructed to a recognised pressure vessel code, e.g. BS 5500, ASME Boiler and Pressure Vessel Code VIII, etc. with full supporting original or re-assessment documentation. The vessel and its supporting structure shall be capable of withstanding safely the acceleration forces required by 4.1.9.

4.2.3 The design pressure shall not be less than 1.725 MPa gauge plus the addition for acceleration forces as mentioned in 4.1.9.

4.2.4 The main seam welds of the vessel shall have been subject to 100% radiography at the time of construction, confirmed by documentation.

4.2.5 At remount the vessel attachment welds shall be subject to non-destructive crack detection as required by BS 7122 or equivalent. Attachment welds are those attaching any item to the pressure envelope i.e. connections and bosses, supports or their backing rings, internal structures such as baffles, stiffening rings, etc. Faults detected shall be assessed and rectified as necessary and recorded in the documentation.

- 4.2.6 The vessel shall be subject to visual internal and external examinations for signs of corrosion, deterioration, dents, detachment of fire-resistant coating, condition of vessel supports and welded joints. All rust shall be removed. In addition, hydraulic and ultrasonic thickness tests shall be carried out. Hydraulic test shall be in accordance with 5.3.
- 4.2.7 The data-plate or a new data-plate shall also clearly indicate that the re-assessment and examination has been carried out by stamping the re-test date and the name of the Listed Competent Person who certifies the tests.
- 4.2.8 Where surface protection is removed to facilitate the requirements above it shall be made good before returning the tank to service.

### **4.3 Mountings**

- 4.3.1 The vessel shall be mounted on the tanker in a sound manner.
- 4.3.2 Mounting structures shall be fabricated in steel and be designed to comply with the requirements of the vessel and chassis manufacturer. They shall take into account all the additional stresses in 4.1.9.
- 4.3.3 Mountings shall be designed as an integral attachment to the shell. Each attachment shall be continuously welded to the shell which shall be locally reinforced to alleviate high stress concentrations.
- 4.3.4 The mountings shall be designed to support the total load of the vessel when filled with water.
- 4.3.5 Vessels and fittings shall be electrically continuous with the chassis of the vehicle and shall be fitted with a connection for attachment of an electrical earth/bonding cable for use during loading/unloading.

### **4.4 External Corrosion Protection**

- 4.4.1 Vessels shall have adequate external protection against corrosion arising from atmospheric influences and this shall be properly and adequately maintained.
- 4.4.2 Exterior surface of the vessel shall be suitably treated by shot-blasting and be cleaned to exclude all rust, grease and dusts to a fire proof coating manufacturer's specification prior to applying surface coating.

### **4.5 Fire Proof Coating**

A fire proof coating of a type which is approved by the Gas Authority shall be applied to the vessel. It shall be painted in a light colour and meet the requirements set out in Appendix B.

### **4.6 Valves and Fittings**

- 4.6.1 All valves, fittings and ancillary equipment shall be of suitable materials for liquid phase LPG at the maximum and minimum pressures and temperatures of service

operation, for service in road tankers and shall be installed or fitted in accordance with the manufacturer's instructions and recommendations.

#### **4.6.2 Primary Shut-off Valves and Systems**

- 4.6.2.1 Primary shut-off valves and systems are valves or a series of valves attached to the vessel shell which serve to ensure the integrity of the vessel and security of its contents.
- 4.6.2.2 Primary shut-off valves and systems shall be of a design intended to leave a closure mechanism intact in the event of external damage.
- 4.6.2.3 All connections to the vessel with a passageway out of the vessel in excess of 1.4mm diameter, other than those for pressure relief valves, or those permanently fitted with blank flanges or plugs, shall incorporate a primary shut-off system.
- 4.6.2.4 The primary shut-off valve and system required depends upon the size and purpose of the vessel connection as below:

***(a)(i) For liquid and vapour line excluding drain, pressure gauge or level gauging connections***

A normally closed internal shut-off valve with its closure mechanism located within the vessel and opened by hydraulic or pneumatic power from the vehicle shall be designed for rapid closure on command by one of at least two manual devices located at convenient remote positions on the vehicle. It shall be labelled in Chinese and English languages to indicate its use. At least one of the manual devices shall be located at a safe distance from the delivery connection. The system shall incorporate a thermally sensitive device which will ensure positive closure in the event of a fire. The closure mechanism shall incorporate an excess flow feature.

***(ii) For liquid discharge as (a)(i) but intended for hoses or hose reels longer than 10 metres***

As (a)(i) At the discretion of the owner, an additional remote manual closure on command from a position adjacent to the receiving vessel by the person controlling the delivery may be installed.

***(b) For filling connections***

As (a)(i) Alternatively, filling only connections may be provided with a double back check provided that above 50mm nominal bore the connection terminates in the vapour space. Otherwise, an excess flow valve or back-check valve, as appropriate, directly mounted into the vessel connection in series combination with a manual shut-off valve may be used. Where access to the valve handle would be restricted, consideration shall be given to shut-off valves with a remote closure facility as in (a)(i).

**(c) For drain connections**

Primary drain connection shall be fitted with a normally closed internal shut-off valve in series with a shut off valve of throttling type.

- 4.6.2.5 Excess flow valves shall be selected to close at a flow rate below that likely to result from a guillotine failure of associated fittings or pipework system for the lowest practicable system pressure. A pressure equalising orifice not greater than 1.4mm diameter shall be incorporated. The closing rate of flow shall not exceed 150% of the nominal flow rate.
- 4.6.2.6 Primary shut-off valves and systems shall not be installed at a location which would be vulnerable to rear collision damage, unless the risk of such damage can be shown to be negligible by adequate protection.

**4.6.3 Secondary Shut-off Valves and Systems**

- 4.6.3.1 Secondary shut-off valves and systems comprise all valves and fittings not connected directly to the tank.
- 4.6.3.2 Valves in pipework for liquid transfer or vapour balance connections used for routine operations shall be located as close as practicable to the end of the rigid pipework, and as close as possible to the final hose inlet.
- 4.6.3.3 Intermediate valves shall be provided to enable individual isolation of the pump or meter. Consideration shall be given to automatic closure of these valves by incorporation in the remote closure system of the primary internal valve (4.6.2.4).

**4.6.4 Safety Relief Valves**

- 4.6.4.1 Vessels shall be equipped with one or more safety relief valves, having direct access to the vapour space of the vessel. The start to discharge pressure shall not be greater than the vessel design pressure. Their total flow capacity shall be sufficient to meet the requirements of the pressure vessel code employed or BS 7122.
- 4.6.4.2 Safety relief valves shall be of the internal spring-loaded type and rain caps shall be provided to prevent the ingress of rain water.
- 4.6.4.3 The discharge outlet of safety relief valve shall be directed away from the vessel to avoid flame impingement on the vessel in the case of ignition of discharging product.
- 4.6.4.4 The valve seat of safety relief valves shall preferably be within the vessel. Otherwise they shall be protected against foreseeable impact damage. Shroud protection shall be designed to ensure it stands proud of the valve and shall be designed so that distortion caused by impact so far as reasonable practicable will not prevent the relief valve from operating.
- 4.6.4.5 Each safety relief valve shall be plainly and permanently stamped with the following information or on a separate metal plate securely affixed to it:

- a) Manufacturer's mark
- b) Date code indicating month and year of manufacture
- c) Nominal set pressure
- d) Valve type number
- e) Discharge capacity at standard conditions

Extra space shall be provided on the valve or on a separate metal plate for subsequent stamping of periodic re-test dates.

#### **4.6.5 Markings**

- 4.6.5.1 All vessel connections excluding relief valve connections and internal shut-off valve connections shall be labelled to designate their purpose and to provide with indications as to opening and closing directions.
- 4.6.5.2 A flow diagram shall be affixed to the vehicle in an easily visible position.
- 4.6.5.3 In accordance with item 18, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, each valve fitted to the road tanker, other than a safety relief valve, shall be prominently and legibly identified in English and Chinese languages. A list of recommended designations in English and Chinese for this purpose is shown in Appendix C.

#### **4.7 Pipework and Ancillary Equipment**

- 4.7.1 All valves/equipment/pipework, their joints with associated jointing materials and thread sealants shall be suitable for use with liquid LPG over the full range of operating temperatures and pressures. The maximum design pressure is the vessel design pressure plus the maximum differential pressure generated by the pump. This is normally not less than 24 bar gauge.

##### **4.7.2 External Pipework**

- 4.7.2.1 Pipework shall be of seamless steel conforming to ASTM A53, BS 3601 or equivalent.
- 4.7.2.2 Steel flanges and flanged fittings shall conform to ANSI B 16.5, BS 1560 or equivalent and bolting arrangement to BS 4882 or equivalent.
- 4.7.2.3 Use of cast-iron pipe shall not be permitted.
- 4.7.2.4 Joints for pipework up to and including 50mm nominal bore, or for proprietary items such as pumps, valves and meters up to 80mm nominal bore, may be threaded. Larger sizes of pipe shall be welded or have welded flanges.
- 4.7.2.5 Welded connection for pipe fittings shall be in accordance with BS 1965 or equivalent.



- 4.7.2.6 Threaded fittings shall be forged carbon steel to BS 3799. Threaded pipes and fittings shall be of heavy wall thickness of Schedule 80 (BS 1600 or equivalent). The thread on both the fitting and pipe shall be tapered and of the same form.
- 4.7.2.7 Jointing materials, thread sealants and gaskets must be compatible with liquid phase LPG. Thread sealants shall be non-setting.
- 4.7.2.8 Gaskets for all flanged joints in external liquid and vapour pipework shall be of spiral wound type to BS 3381 or equivalent and shall be fitted with a metal centre ring.
- 4.7.2.9 Care must be taken to ensure that pipework and fittings are located away from any moving parts on the road tanker such as the propeller shaft to avoid the risk of damage. Consideration should be given to installing a metal protection guard of robust construction to protect the LPG pipework underneath the chassis from damage by moving parts of the vehicle.
- 4.7.2.10 In accordance with item 7, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, all valves, fittings, pumps, pipework and accessories fitted to the road tanker shall be so situated or protected that the risk of damage or leakage of LPG in the event of the tanker being involved in a traffic accident is, so far as is practicable, minimised.
- 4.7.2.11 Mechanical barriers shall not be attached to pipework or valves which they are intended to protect.

### **4.7.3 Flexible Connections**

- 4.7.3.1 Provision shall be made for any relative movement between items of equipment and the chassis, or the vessel.
- 4.7.3.2 Flexible connections between items of equipment or pipework shall be designed for the same operating limits as hoses to BS 4089 or BS 6501, Part 1 and have electrical continuity unless other means of continuity is provided.
- 4.7.3.3 Proprietary flexible connections must be installed strictly to the manufacturer's instructions. Most require careful attention to length between ends, end displacement and method of attachment, which need to be considered at the pipework design stage.
- 4.7.3.4 Hoses used as flexible connections between items of equipment or pipework shall be no longer than is required to avoid over stressing adjacent pipework or equipment.
- 4.7.3.5 Hoses above 50mm nominal bore shall be fitted with flanged rather than threaded end connections.
- 4.7.3.6 The flexible metallic hose shall be labelled with the manufacture date.

#### **4.7.4 Hydrostatic Pressure Relief Valves (HPRVs)**

4.7.4.1 In accordance with item 8, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, any section of a pipe or hose of the road tanker which may:

- a) contain liquid LPG; and
- b) be closed at each end,

shall be provided with HPRV to protect that section from bursting due to increase of hydraulic pressure caused by temperature rise likely to be encountered in operation.

4.7.4.2 The discharge outlet of HPRV shall be positioned towards ventilated areas and shall not be directed outwards of the pipework cabinet opening.

4.7.4.3 HPRV shall be set to discharge above the maximum working pressure but not above the design pressure of the equipment being protected. Typically, this should have a pressure rating in the range of 2.4 MPa (350psig) to 2.75MPa (400psig). The pressure setting of HPRV shall not be higher than the weakest element in the pipework section it protects.

4.7.4.4 HPRVs shall be protected by rain caps.

#### **4.7.5 Contents Gauges and Level Gauges**

4.7.5.1 Vessels shall be fitted with a suitable contents gauge.

4.7.5.2 If the contents of vessels are to be measured by volume with a rotary dip tube or magnetic gauge, one or more fixed maximum level device as a check on these gauges shall be provided.

4.7.5.3 Fixed maximum level devices shall be correctly set such that:

- a) Regulation 10 of the Gas Safety (Gas Supply) Regulation will be met. In accordance with the regulation, the owner of a tank shall not set a fixed maximum level device other than at a setting such that, at a temperature of 47.5°C, the bulk tank will not be more than 97% full of LPG in liquid form; and at a temperature of 52.5°C, the tank will not be full of LPG. As a rule of thumb, the vessel shall not be filled more than 85% of the vessel volume.
- b) The statutory limitation of the maximum permitted gross laden weight and/or gross axle weights for the vehicle will not be exceeded.
- c) The maximum permitted carrying capacity of LPG of road tanker set out in 4.1.1 will not be exceeded.

4.7.5.4 The termination of internal pipes to these gauges shall be located on a vertical line which is as near the volumetric centre of the vessel as practicable.

4.7.5.5 Fixed maximum level devices shall be marked or labelled.

- 4.7.5.6 Any gauging device that relies on bleeding to atmosphere, such as rotary dip tube or fixed tube shall be such that:
- a) the bleed hole maximum opening is not larger than 1.4mm diameter otherwise it shall be protected by a shut-off valve and a suitable excess flow valve.
  - b) the operational bleed screw shall remain captive at all times.

#### **4.7.6 Pumps**

- 4.7.6.1 The design and materials of construction shall be suitable for use with liquid LPG and the service conditions, including the maximum outlet pressure to which they may be subject, see 4.7.1. Cast irons shall not be used unless they have adequate ductility and resistance to brittle fracture over the range of pressures and temperatures involved which can be as low as the boiling point of LPG being handled. Ductile iron to BS 2789 with an elongation at fracture of not less than 18% is acceptable.
- 4.7.6.2 The rotational speed of the drive shall have controls or shall be limited to prevent the rating of the pump being exceeded.
- 4.7.6.3 In addition to any internal pump overpressure by-pass, the pump or adjacent pipework must be fitted with a separate by-pass valve set at a lower differential pressure to automatically carry any excess liquid back to the road tanker vessel when the delivery valve is closed. The by-pass valve shall be suitably sized to accommodate the pump discharge flow rate.
- 4.7.6.4 A suitable strainer, shall be fitted to the pump inlet.

#### **4.7.7 Meters**

- 4.7.7.1 The design and materials of construction shall be suitable for use with liquid LPG and the service conditions, see 4.7.1. Cast irons shall not be used unless they have adequate ductility and resistance to brittle failure over the range of pressures and temperatures to which they may be subject which can be as low as the boiling point of the LPG being handled. Ductile iron to BS 2789 with an elongation at fracture of not less than 18% is acceptable.
- 4.7.7.2 Means shall be provided to eliminate vapour from the liquid phase LPG before it passes into the meter measuring chamber.
- 4.7.7.3 Means of measuring the liquid temperature shall be provided for meters which do not have automatic temperature compensation and shall be located in pipework leading to the meter.

#### **4.7.8 Thermometers**

- 4.7.8.1 For temperature measurement of LPG a thermometer pocket shall be used which shall be a blind tube of suitable length constructed to the design code of the vessel or pipework into which it is permanently welded.

#### **4.7.9 Pressure Gauges**

- 4.7.9.1 A pressure gauge shall be protected by a manual shut-off valve and excess flow valve unless the connection through the vessel is 1.4mm diameter or less.

#### **4.7.10 Transfer Hoses and Hose Reels**

- 4.7.10.1 Hoses for liquid transfer and vapour balance (if installed) shall comply with BS 4089 or BS EN 1762 and shall be in one manufactured length without intermediate joints or couplers.

- 4.7.10.2 Electrical continuity shall exist between the vessel and the hose free-end coupling. The electrical resistance shall not exceed  $1 \times 10^6$  ohms.

- 4.7.10.3 Hose end valves shall be capable of being latched in the closed position or otherwise protected against inadvertent opening.

- 4.7.10.4 Hose end valves shall have a suitable secure storage location to prevent movement when the vehicle is in motion.

- 4.7.10.5 Loose transfer hoses, if available, shall be fitted with manual shut-off valves at both ends and hoses other than for vapour balance shall be fitted with suitable HPRVs.

- 4.7.10.6 Hose for hose-reels shall not on rewind in the liquid full condition create a pressure rise liable to cause HPRV to discharge.

**Note:** Tests reveal that hoses of 25mm nominal bore exceeding 40 metres in length may give rise to such excessive pressures.

- 4.7.10.7 Where hose-reels with hoses exceeding 30 metres in length are considered, consideration shall be given to the physical effort required to draw out the hose.

- 4.7.10.8 Hose reels with powered rewind drives shall have means of stopping the drive either by a conveniently located switch or by purpose designed drive clutch slip.

- 4.7.10.9 Hose reel power drives shall be fitted with suitable guards to protect operators.

- 4.7.10.10 The connection between hose and hose reel shall be of welded joint, or flanged joint using at least 4 studs-and-nuts arrangement.

#### **4.7.11 Pull-away Coupling**

- 4.7.11.1 In accordance with regulation 40(1) of Gas Safety (Gas Supply) Regulations, a device shall be fitted to the tanker or the LPG installation to protect against the dangers which may arise due to the movement of the tanker whilst the LPG transfer hoses are connected between the tanker and the installation. An example of this device is pull-away coupling.

- 4.7.11.2 In accordance with regulation 40(2) of Gas Safety (Gas Supply) Regulations, the safety device shall:

- a) be maintained at all times in good and efficient working order;
- b) be automatic in operation;
- c) when in operation:
  - i. protect the LPG transfer hoses to which it is connected from rupture or other damage; and
  - ii. release not more than 0.1 litres of LPG in liquid form.

#### 4.7.12 **Hose End Couplings**

4.7.12.1 Where it is necessary to use an adaptor to enable a loading/unloading operation to be carried out where differing couplings exist on the tanker and storage vessel, only one single adaptor should be used.

4.7.12.2 Where any storage vessel is to be filled on a regular basis by one supplier the use of adaptors should be avoided by ensuring that the couplings on the storage vessel are compatible with those on the tanker hoses. Incompatible couplings should be replaced.

#### 4.8 **Electrostatic Earth Provision**

4.8.1 In addition to the provisions in 3.9, the vehicle vessel shall be provided with a flexible earth continuity wire to dissipate any electrostatic potential which may develop between the tanker, piping, static tank and the ground during loading and unloading operations. The chassis, vessel, pipework and accessories shall be electrically bonded together to ensure electrical continuity.

## **5 COMMISSIONING, TESTING AND EXAMINATION**

### **5.1 General**

- 5.1.1 The owner of the road tanker shall carry out necessary tests and inspections on the vehicle and the LPG system during initial commissioning of the road tanker and thereafter periodically to ensure the road tanker is in a safe condition and that it complies with the requirements of this Code of Practice at all times.
- 5.1.2 Testing and examination of road tanker, vessel, pipework and associated equipment fitted on the vehicle shall be carried out in accordance with relevant standards, manufacturer's instructions and this code of practice as appropriate.
- 5.1.3 Special requirements for testing and examination to be carried out for remounted vessel are set out in 4.2.
- 5.1.4 Purging to be carried out before and after any test and examination of a road tanker shall be performed in accordance with the procedures and recommendations in 5.8 and 5.9.

### **5.2 Documentation and Records**

- 5.2.1 Records and certificates of all tests carried out under this Section shall be retained and updated for the service life of the road tanker.
- 5.2.2 Test records or certificates should contain, but is not limited to, the following information, as appropriate:
- a) Vessel/equipment serial number or identification reference;
  - b) Relevant standard employed for the test and/or a brief description of test method;
  - c) Test results, findings and conclusions;
  - d) Criteria for assessment of the findings;
  - e) Any defects, damage or signs of deterioration observed;
  - f) Any repair or rectification actions taken;
  - g) Test pressure, medium and duration (for pressure tests);
  - h) HPRV pressure setting (for pipework pressure tests);
  - i) Set pressure and start-to-discharge pressure (for pressure relief valves revalidation test);
  - j) Signature and name of the inspection agent or the responsible listed competent person; and

k) Test date.

### **5.3 Initial Testing and Inspection during Construction**

This Section sets out the requirements for the inspections to be carried out during construction of the pressure system and initial inspection after the installation works. The inspections are normally carried out by vessel/pipework manufacturer or individual equipment supplier at respective place of manufacture of the equipment.

**Note:** Where the inspections specified in this Section have been satisfactory completed at manufacturer's plant, unless otherwise stated, it is normally not necessary to carry out these inspections again in Hong Kong provided that a valid certificate of inspection can be produced.

#### **5.3.1 Vessel**

5.3.1.1 An independent inspector shall be employed to carry out design assessment and stage inspections and witness the carrying out of production tests as necessary during design and construction of the vessel to ensure the relevant pressure design code employed is fully complied with.

On satisfactory completion of all the necessary assessment, testing and examinations, a third party inspection certificate shall be issued by the inspector to certify that the vessel has been designed, constructed and inspected in full compliance with the relevant pressure vessel code.

5.3.1.2 Impact tests shall be carried out on materials used in the construction of vessels at minimum design temperature or lower. The materials shall have impact values complying with the minimum requirements of the relevant pressure vessel code.

5.3.1.3 All main seams and butt welds shall be subject to 100% radiographic examination.

5.3.1.4 The vessel shall be stress relieved to the pressure vessel code employed after the completion of all hot work.

5.3.1.5 All welds directly on the shell of the tank internally and externally shall be subject to magnetic particle tests to detect any surface crack.

5.3.1.6 Ultrasonic thickness tests shall be carried out to record the original wall thickness of the vessel. Wall thickness shall be measured on the shell and heads, in particular, areas at the bottom centre of the vessel and areas around weld joins and openings.

5.3.1.7 The vessel shall be hydrostatically pressure tested at 1.5 times of the design pressure for a minimum period of 30 minutes or that specified in the relevant pressure vessel code for integrity.

5.3.1.8 All necessary tests and examinations on fire proof coating as required by the coating manufacturer shall be carried out. A certificate indicating the satisfactory application of the coating to the coating manufacturer's standard shall be issued by an inspector recognized by the coating manufacturer. The thickness of the coating measured shall be recorded in the certificate.

### **5.3.2 Pipework**

5.3.2.1 All external pipework and fittings including metallic flexible connections shall be hydrostatically pressure tested to 1.1 times the pressure setting of the HPRV prior to fitting to the vessel.

5.3.2.2 A pneumatic leak test at a pressure of 6.9 bar gauge (100 psig) shall be carried out on completion of assembly of the vessel, pipework, valves and fittings for leakage detection.

5.3.2.3 The below listed proprietary items installed on the road tanker shall be suitably tested, inspected or/and calibrated, as appropriate, to manufacturer specifications or a recognised standard specified by the manufacturer. A valid certificate of tests/inspection shall be issued by the road tanker manufacturer or respective equipment suppliers.

- a) Transfer hoses
- b) Pressure gauges
- c) Temperature gauges
- d) Shut-off valves
- e) Internal shut-off valves
- f) Excess flow valves
- g) Pressure relief valves
- h) Hydrostatic pressure relief valves (HPRVs)

### **5.4 Commissioning Inspection**

This Section sets out the requirements for inspections and tests to be carried out after the vehicle arrived in Hong Kong and before being put into use for the first time. These inspections should be carried out by the owner of the vehicle or a person authorised by the owner on that behalf.

The Authority shall witness the carrying out of the tests and examinations under 5.4.2.



#### **5.4.1 LPG System**

- 5.4.1.1 For vehicles where the assembly work are done overseas, an additional pneumatic leak test shall be carried out for the LPG system in Hong Kong and before first filling with LPG to re-confirm satisfactory pressure containment of the whole system.
- 5.4.1.2 A visual inspection of fireproof coating of the vessel shall be carried out to ensure there are no apparent damage, detachment and defects.

#### **5.4.2 Control and Safety Devices**

- 5.4.2.1 The engine emergency stop device shall be tested to ensure the engine is to be shut down properly.
- 5.4.2.2 Each of the remote manual control devices for the vessel internal shut-off valves shall be tested to ensure they are to operate smoothly and function as intended.
- 5.4.2.3 A functional test shall be carried out for the prevention of engine over-running device referred to in 3.1.3 to ensure its effective operation.
- 5.4.2.4 A functional test shall be carried out for the drive away prevention interlocks and its associated bypass device referred to in 3.7 to ensure its effective operation.
- 5.4.2.5 The pull-away coupling shall be tested to ensure its operating mechanism is in good and efficient working order.
- 5.4.2.6 The electrical master switch and the associated remote control device in driver's cab shall be tested to ensure it functions properly.
- 5.4.2.7 The electrical continuity between the free-end of the earth continuity wire and the vessel shall be measured to ensure the resistance do not exceed  $1 \times 10^6$  ohms for effective dissipation of electrostatic potential.

#### **5.4.3 Fire Extinguishers**

- 5.4.3.1 All dry powder fire extinguishers shall be inspected and tested by a contractor registered by the Fire Services Department. A valid certificate shall be issued by the contractor to confirm they are in satisfactory operating condition.

#### **5.4.4 Rotary Content Gauge**

- 5.4.4.1 The rotary gauge shall be functionally tested for reasonable accuracy.

#### **5.4.5 Weight Bridge Check**

- 5.4.5.1 A weight bridge check shall be carried out before and after filling a new road tanker for the first time to the fixed maximum level device (with driver and attendant on board) to ensure the level device is correctly set and that the criteria listed in 4.7.5.3 is fully complied with.

5.4.5.2 The maximum amount of LPG that can be carried by the road tanker as determined in the weight bridge check shall be recorded.

## **5.5 Annual Testing and Examination**

5.5.1 In addition to the tests and examinations specified in this Section, those specified in 5.4, other than 5.4.5, shall be re-conducted at least once a year to ensure the continued safe operation of the vehicle.

5.5.2 Tests and examinations under 5.5.3 shall be supervised by a Listed Competent Person (Class 1). Certificates of tests shall be issued and signed by the responsible Listed Competent Person.

### **5.5.3 LPG System**

5.5.3.1 Transfer hose shall be subject to:

- a) A hydrostatic pressure test to the maximum permitted working pressure for the hose i.e. 25 bar minimum;
- b) An electrical continuity test. The electrical resistance measured between the end fittings shall not exceed  $1 \times 10^6$  ohms; and,
- c) Visual examinations for kinks, wear, defects and obvious damage to the hose.

5.5.3.2 All internal shut-off valves shall be subject to:

- a) Operation check of a spring loaded valve: Test can be performed by activating the remote control devices to completely close and reopen the valves and check to see that the valve operating levers move freely, smoothly and in correct direction.
- b) Excess flow feature check: A sufficient surge should be created by using a quick opening valve to control sudden, momentary flow into a volume containing low pressure. An audible click from the excess flow valve and the corresponding stoppage of flow indicates its closure.
- c) Tight shut off test: A test shall be made to ensure that the internal valve will give a gas tight seal when the valve is in the normal closed position. This will require removal of all product downstream from the internal valve to ensure that the internal valve will give a 100% seal when in the closed position. If the internal valve does not give 100% seal, the valve shall not be used.

5.5.3.3 All pressure gauges and temperature gauges shall be suitably tested and calibrated to ensure accuracy.

### **5.5.4 Pipework**

5.5.4.1 Pipework and fittings shall be visually inspected to ensure no obvious defects and corrosion and be properly refurbished to prevent corrosion.

- 5.5.4.2 Coatings where applied shall be maintained in good condition.
- 5.5.4.3 All manual shut off valves shall be tested for ease of operation and inspected to ensure no obvious damage.
- 5.5.4.4 The swivel joint shall be thoroughly inspected internally to ensure satisfactory pressure containment and smooth operation. Where necessary, sealing materials shall be replaced to manufacturer's specification.
- 5.5.4.5 Loading and unloading couplings shall be visually inspected to detect wear beyond acceptable limits and the replacement as necessary of seals.
- 5.5.4.6 On satisfactory completion of all pipework testing and reassembly of pipework, fitting and vessel, a pneumatic leak test at a pressure of 6.9 bar gauge (100 psig) shall be carried out to ensure satisfactory pressure containment of all joints.

### **5.5.5 Vehicle**

- 5.5.5.1 All welds and joints on vessel mountings shall be visually inspected to detect any obvious crack, corrosion or damage which might affect its integrity.
- 5.5.5.2 Particular attention is drawn to the integrity of the joints connected to the vehicle propeller shaft. This shall be inspected carefully to ensure there is no sign of damage or loosening and adequate clearance is maintained between the shaft and LPG pipework.
- 5.5.5.3 Identification labels, emergency contact numbers, warning signs and pipework schematic line diagrams shall be checked to ensure that they are up-to-date, in place and legible.
- 5.5.5.4 Each electrical equipment and cable connection shall be inspected and properly maintained in accordance with manufacturer instructions to ensure satisfactory condition.

### **5.6 Five Yearly Revalidation of LPG System**

- 5.6.1 In addition to the tests and examinations specified in this Section, those specified in 5.5, including 5.4.5, shall be carried out during five-yearly revalidation of the LPG system.
- 5.6.2 Tests and examinations under 5.6.3 shall be supervised by a Listed Competent Person (Class 1). On satisfactory completion of all the tests and examination, the responsible Listed Competent Person shall issue a certificate of inspection, which certifies that the vessel and its associated pipework is fit for intended purpose and safe for continued operation. The certificate shall be signed by the Listed Competent Person.

### **5.6.3 Vessel Revalidation**

- 5.6.3.1 A visual inspection on internal surface of the vessel shall be carried out for corroded area, dents, and defects in welds. The visual examination shall be supplemented by appropriate non-destructive examination or other test where defects or any suspicious area are revealed.
- 5.6.3.2 All welds directly on the shell of the tank internally shall be subject to magnetic particle tests.
- 5.6.3.3 Ultrasonic thickness tests shall be carried out to record the wall thickness of the vessel. Thickness shall be measured on the shell and heads, in particular, areas at the bottom centre of the vessel, areas around weld joins and openings and area subject to localised corrosion.
- 5.6.3.4 The vessel shall be hydrostatically pressure tested at 1.5 times of the design pressure for a minimum period of 30 minutes, or that specified in the pressure vessel code employed for integrity.
- 5.6.3.5 All rust shall be removed and all defects shall be suitably repaired prior to re-commissioning. Assessment of any defects revealed shall be performed to relevant pressure vessel code. See also 6.4.
- 5.6.3.6 HPRVs and pressure relief valves shall be re-conditioned and re-tested, or replaced where necessary. See also 6.4.7 & 6.4.8.

### **5.6.4 Pipework Revalidation**

- 5.6.4.1 All gaskets for external liquid and vapour pipework shall be replaced with new ones.
- 5.6.4.2 All external pipework and fittings including metallic flexible connections shall be hydrostatically pressure tested to 1.1 times the pressure setting of the HPRV.
- 5.6.4.3 Flexible metallic hoses and transfer hose shall be replaced where necessary. See also 6.4.6. All replacement items shall be provided with valid certificates of inspection.

### **5.7 Accident Damage**

- 5.7.1 A vessel or its associated pipework or equipment which has been subject to accident damage in such a way that it may affect its safety, must not be returned to service until it has satisfactorily passed the periodic inspection procedures outlined in the above relevant sections.
- 5.7.2 The mounting structure of the vessel which has been subject to damage should be examined, tested and repaired to satisfy the requirements of BS 3951, Part 2-Section 2.3 or equivalent.

## 5.8 Purging into Service

- 5.8.1 Vessel shall be purged into service using cycle purging method (pressure and vent method).
- 5.8.2 Warning notices in particular “No Smoking” and “No Naked Lights” signs should be prominently displayed around the work site.
- 5.8.3 At least one 2kg or higher capacity dry powder fire extinguisher should be available at work site.
- 5.8.4 Purging operation shall be manned throughout the process.
- 5.8.5 Purging into service procedure of the vessel shall take the following two steps.

a) Inert Gas Purge with cycling purging method - The content inside the vessel is to be diluted by the purge gas. Pressure is being increased by the purge gas and subsequently the gas mixture is being vent off till the vessel reduces to atmospheric pressure. This process is repeated until the required dilution is achieved or the replacement by the purge gas is completed.

- ♦ Inert gas is introduced into the system and the maximum pressure allowed in this method shall not exceed 68.9kpa (10 psi). The purge gas will mix with air inside. The mixture is then vent off to atmosphere.
- ♦ When the oxygen level inside the vessel is reduced to less than or equal to 11.4% by volume, the content shall be vent off until the pressure is reduced to just above atmosphere pressure.

**Note:** If the medium of pressure test is inert gas, the above procedure is not necessary as long as the inert gas is maintained above atmosphere pressure within the vessel.

b) LPG Purge

- ♦ To prevent rapid vaporisation of liquid LPG, only vapour LPG shall be admitted into the vessel until the vessel pressure is close to the supply pressure.
- ♦ The LPG gas will mix with inert gas inside. The mixture shall then be vent off and as per 5.8.7.
- ♦ After a stable flame has been established or the reading of gas detector exceeds 10% LEL, the venting operation shall be stopped.
- ♦ Liquid LPG should then be introduced into the bottom of the vessel to avoid sudden chilling of the vessel.

**Note:** LPG should be introduced into the bottom of the vessel via the filling connection if the vessel is of a bottom-fill arrangement. Otherwise, it may

be via the liquid withdrawal or the drain connection if it is not fitted with a check valve.

5.8.6 The procedure for purging pipework into service is as follows: (ram purge method)

- ♦ To avoid sudden chilling of the pipework, only vapour LPG shall be introduced into the pipework.
- ♦ Direct purge of air in the piping system of a road tanker (relative short) with vapour LPG is permitted.
- ♦ For pipework sizes up to 32 mm nominal bore, LPG/air gas mixture may be dispersed under proper supervision to a well-ventilated area without any source of ignition.
- ♦ For pipework sizes above 32 mm, the venting shall follow 5.8.7.

### 5.8.7 Venting

5.8.7.1 Two basic methods can be used to vent off the gas in the vessel and pipework system.

a) Flaring

- ♦ Flare stack shall be equipped with a proper burner and a permanent pilot.
- ♦ The flare stack should be located at a safe distance at least 15m away from any LPG bulk tanks or cylinder stores, flammable substance and within a controlled safe area.
- ♦ The flare stack pipe shall be metallic and incorporate with a flame arrestor.
- ♦ Fire Service Department shall be informed before flaring operation commences.
- ♦ After a stable flame has been established, the flaring operation shall be stopped. See also 5.8.7.2

b) Direct Vent

- ♦ Inert gas can be vented directly to atmosphere in well ventilated area.
- ♦ LPG/inert gas or LPG/air mixture may be dispersed under proper supervision to a well ventilated area without a pilot flame if the following conditions are met:

- i. the vent pipe is terminated at a minimum height of 2.5 m above ground level.
  - ii. the vent pipe is located within a manned controlled safe area where it is cordoned off from the public and no source of ignition exists within a 4.5 meter radius controlled area.
  - iii. gas detector shall be used to monitor the combustible gas level within and adjacent to the controlled area.
  - iv. venting operation shall be stopped immediately when the reading of the gas detector exceeds 10% LEL.
  - v. venting operation shall not be recommenced until the percentage of LEL in the controlled area falls below 10%.
- ♦ When the reading of the gas detector exceeds and does not fall below 10% LEL, the venting operation shall be stopped.

5.8.7.2 Care shall be taken to ensure complete removal of the inert gas before terminating the flaring process. The completion of purging process may be indicated by a stable flame at the flaring stack or by measuring the gas purity against calibrated chemical reagent gas detection tube. Some gas detectors with built-in 100% by volume gas content reading can also be used for the measurement.

## 5.9 Purging out of Service

5.9.1 Before introducing air into the vessel, it shall be purged with inert gas such as nitrogen gas so that the LEL level is less than 10%.

5.9.2 Warning notices in particular “No Smoking” and “No Naked Lights” signs should be prominently displayed at the work site.

5.9.3 At least one 2kg or higher capacity dry powder fire extinguisher shall be available at work site.

5.9.4 Purging and venting operation shall be manned throughout the process.

5.9.5 The vessel to be purged out of service shall be depressurised through normal consumption or decanted using flaring or venting as described in 5.8.7.

5.9.6 Purging out of service procedure of the vessel shall take the following two steps.

a) Inert Gas Purge with cycling purging method - The content inside the vessel is to be diluted by the purge gas. Pressure is being increased by the purge gas and subsequently the gas mixture is being vented off till the vessel reduces to atmospheric pressure. This process is repeated until the required dilution is achieved or the replacement by the purge gas is completed.

- ♦ Inert gas is introduced into the vessel and the maximum pressure allowed in this method shall not exceed 68.9kpa (10 psi). The purge

gas will mix with LPG inside. The mixture is then vent off to atmosphere according to 5.8.7

- ♦ The LEL level inside the vessel shall be reduced to less than or equal to 10%.

**Note:** If water is used to purge the vessel, it should be introduced at the bottom of the vessel to purge the LPG out of the vessel.

b) Air Introduction

- ♦ Once the vessel content is below 10% LEL and at atmospheric pressure, the manhole cover may then be removed and air be introduced into the vessel.
- ♦ No one shall enter into the vessel until the internal atmosphere has been verified to be safe.

5.9.7 Direct purge of LPG by air is not allowed. An interface of inert gas or water shall be used to purge LPG out of the vessel

5.9.8 No one shall carry out any hot work to the vessel until the atmosphere inside the vessel and the surrounding atmosphere is verified to contain LPG at a level of less than 10% of LEL.



## **6 MAINTENANCE AND REPAIR**

### **6.1 General**

The owner of the road tanker shall carry out regular checks, maintenance and repairs as necessary on the vehicle and the LPG system to ensure the road tanker is in a continued safe condition and that it complies with the requirements of this Code of Practice at all times.

### **6.2 Documentation and Records**

6.2.1 A systematic routine maintenance plan shall be established by the owner of the road tanker and be documented. The plan should contain detailed instructions on what maintenance items are to be carried out, the scope of works, the intervals at which, or the circumstance in which, such works shall be carried out. It should also be reviewed and updated as necessary.

When preparing the plan, sufficient regards should be paid to the relevant standards employed, the manufacturer's recommendations and the history and conditions of individual equipment or road tanker.

6.2.2 Maintenance records shall be kept by the owner for the service life of the road tanker.

### **6.3 Maintenance Workshop and Personnel**

6.3.1 Persons engaged in maintenance and repair work shall be competent persons. They shall have access to relevant standards, maintenance manuals and operating instructions and shall adhere to them, as far as is practicable.

6.3.2 No unauthorised person shall be permitted to gain access to the road tankers.

6.3.3 Except the necessary repairs to be carried out in the event of a vehicle breakdown or of a gas leakage to render the vehicle safe, any maintenance or repair work on road tankers containing LPG shall only be carried out at designated area within LPG terminals or a designated road tanker workshop.

6.3.4 Workshops as referred to in 6.3.3 shall be assessed by the responsible RGSC to ensure the environment is safe and suitable for carrying out the work. The RGSC shall also ensure sufficient safety and security measures are in force at the workshop to protect the vehicle against public interference, fire and explosion hazards at all times.

6.3.5 RGSC shall notify the Authority in writing the contact person, the company name and address of its vehicle workshop, if any.

6.3.6 For any maintenance and repair work carried out at a location other than LPG terminals, the vessel and its associated pipework shall be properly gas-freed and a valid gas-free certificate be issued before any work commences, except those works which:

- a) are to be completed in one day shift and do not require overnight parking of the vehicle at the workshop;
- b) do not involve any hot work; and
- c) do not involve any disassembly, repairs and maintenance of the pressure containing system.

In such exceptional circumstances, the content of LPG of the vehicle shall be reduced to an as low as reasonably practicable level through normal product unloading, and all the isolation valves shall be closed before the vehicle enters the workshop. Additionally, the vehicle shall be manned at all times.

- 6.3.7 Purging of a road tanker carried out at a location other than LPG terminals shall be supervised by a Listed Competent Person (Class 1). A gas-free certificate shall be issued and signed by the responsible Listed Competent Person. The certificate shall be kept on the vehicle during the maintenance period.
- 6.3.8 Purging sites for flaring or venting of a road tanker as referred to in 6.3.7 shall be assessed by the responsible RGSC to ensure the environment is safe and suitable for carrying out the work. The RGSC shall also ensure sufficient safety and security measures are in force at the site to protect the vehicle against public interference, fire and explosion hazards at all times.
- 6.3.9 RGSC shall notify the Authority in writing the contact person, the company name and address of its purging site, if any at a location other than LPG terminals.

## **6.4 LPG System**

- 6.4.1 Hot work and any work which involves entry to vessel shall be governed by a proper work permit system. Work permit records shall be kept by the owner for at least 5 years as part of the maintenance records.
- 6.4.2 Weld repairs to the pressure containing system shall only be conducted after the system has been satisfactorily purged and cleaned to eliminate any sources of LPG and a gas-free certificate has been issued.
- 6.4.3 Repairs to pressure vessel and subsequent tests and inspections shall be carried out in accordance with the relevant pressure vessel code.
- 6.4.4 When a flange is open, the gaskets shall be replaced.
- 6.4.5 For any maintenance work which involves disassembly of pipework or opening the vessel, a pneumatic leak test at a pressure of 6.9 bar gauges (100 psig) shall be carried out before filling the system with LPG to ensure satisfactory pressure containment of all joints.
- 6.4.6 Flexible metallic hoses and transfer hoses shall be replaced if they have been put into service in excess of 5 years.

- 6.4.7 Pressure relief valves shall be replaced at intervals not exceeding 5 years with new or re-conditioned units of appropriate set pressure and capacity.
- 6.4.8 HPRVs at the liquid sections shall be replaced at intervals not exceeding 10 years with new or re-conditioned units of appropriate set pressure and capacity.
- 6.4.9 Functional test should be conducted for the pull-away coupling at least quarterly to confirm that it will separate properly and no continuous gas escape at the instant of separation.

## **6.5 Alterations to Road Tanker**

In accordance with regulation 35 of the Gas Safety (Gas Supply) Regulations, no material alteration in the design, or construction or relevant equipment specified in Schedule 2 of the regulations, of the road tanker shall be made without the permission in writing of the Gas Authority.

## 7 HAZARD WARNING PANELS AND LABELS

7.1 In accordance with item 16, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the road tanker shall prominently and legibly displayed, in the English and Chinese languages, in letters and characters not less than 120 millimetres in height, the following notices:

a) at the front end of the tanker - “CAUTION LPG  
小心石油氣”

b) at the rear end of the tanker - “CAUTION LPG - KEEP CLEAR  
小心石油氣 - 不得駛近”

c) at each side of the tanker - “CAUTION LPG - NO SMOKING  
小心石油氣 - 不准吸煙”

A typical arrangement of the warning notices is shown in Appendix G.

7.2 In accordance with item 17, Part I, Schedule 2 of the Gas Safety (Gas Supply) Regulations, the name and telephone number of the person to be contacted in the event of an emergency involving the road tanker shall be prominently and legibly displayed in the English and Chinese languages on each door of the cab of the tanker.

7.3 A road tanker must in addition to 7.1 display three (3) hazard warning panels applicable to the load to be conveyed, i.e. commercial propane, commercial butane, mixtures thereof or unodorised product. One panel must be positioned at the rear of the vehicle and one on each side of the vehicle all in a substantially vertical plane, and at least 1 metre from the ground.

7.4 The hazard warning panels shall be in orange colour and shall display substance number 1075, substance name, emergency action code 2WE, emergency contact number and contact number for specialist advice and warning sign.

## **8 OPERATIONAL REQUIREMENTS**

### **8.1 Only Competent Persons to be Employed on Road Tankers**

- 8.1.1 Any operation in relation to the use of the road tanker which is carrying LPG, or the loading into and discharge from a road tanker must be carried out by at least 2 competent persons. (One of these 2 persons must be Listed CP Employed on LPG Road Tankers and the other may be inexperienced driver/attendant referred to in 8.1.8, which carries out the operation under the supervision of the Listed CP.)
- 8.1.2 The Registered Gas Supply Company (RGSC) should notify the Gas Authority, by using form “EMSD/GSO/113 - Record of Competent Person Employed on Road Tanker”, the details of any driver or attendant employed on the LPG road tankers it operates or that are operated by others on its behalf.
- 8.1.3 The form EMSD/GSO/113 shall be completed on first appointment of a driver/attendant, irrespective of whether such person is a Listed CP. It should be submitted to the Authority as soon as possible, but in any case not later than 14 days from the date of commencing the duties referred to in 8.1.1.
- 8.1.4 The minimum requirements for training of competent persons are listed in Appendix D.
- 8.1.5 Medical examinations shall be carried out at least once every two years for every Listed CP. The examining doctor shall be asked to confirm that the person is fit to work. For drivers, the doctor shall be asked to certify that the person is fit to drive a medium goods vehicle/heavy goods vehicle/road tanker as appropriate.
- 8.1.6 Drug tests shall be carried out at least once every year for each Listed CP. The drugs to be tested are those commonly abused drugs in Hong Kong including Cannabis, Ecstasy, Heroin, Ice and Opium.
- 8.1.7 Random alcohol tests shall be carried out for all drivers/attendants in accordance with the guidelines in Appendix H.
- 8.1.8 For any new driver/attendant who does not have previous experience of carrying out work in relation to the operation of LPG road tankers, the RGSC must arrange this person to carry out the duties under supervision of a Listed CP Employed on LPG Road Tankers until such time this condition has been waived by the Authority.

During this period, the driver/attendant shall keep log of the delivery journey carried out by him/her on a form, Annex (I) of EMSD/GSO/113 - The Practical Experience Record Form, and signed by the Listed CP who accompanied with him/her during the operation.

The RGSC may seek approval from the Authority for waiving the condition by submitting the completed Annex (I) of EMSD/GSO/113 by the time the RGSC concerned is of the view that the driver/attendant has acquired sufficient practical experience to carry out his/her duties in relation to the operation of an LPG road tanker in a competent manner. This period is normally not less than 3 months after the driver/attendant takes up his duties, and by the time, at least 30 number

of road tanker delivery journeys should have been carried out by the driver/attendant.

- 8.1.9 A form “EMSD/GSO/114 - Annual Record Update for Competent Person Employed on Road Tanker” shall be submitted every following year as an update for the training records, drugs test records and medical test records.
- 8.1.10 If any CP ceases to be employed as LPG road tanker driver/attendant, the RGSC should inform the Authority of such fact within 14 days thereafter.
- 8.1.11 Any Listed CP Employed on Road Tankers, who have ceased to work on a road tanker for over one year shall be removed from the list of CP. Thereafter, if such person is re-employed on a road tanker, he/she shall be treated as a new driver/attendant and shall follow the requirements in 8.1.8

## **8.2 Information to be Carried on a Road Tanker**

- 8.2.1 A valid road tanker permit label shall be displayed on the left-hand side of the vehicle’s windscreen in such a manner that it is clearly visible from the front of the vehicle. The permit shall be removed from the windscreen when it is no longer valid.
- 8.2.2 Specific guidance on the action to be followed in an emergency shall be displayed in the cab of the road tanker in both Chinese and English languages. See Appendix F.

## **8.3 Special Precautions Against Fire and Explosion**

- 8.3.1 A driver or any other person shall not smoke or carry any naked flame at any time whilst involved in the loading, unloading or carriage of LPG.
- 8.3.2 No artificial light other than a light which is not liable by virtue of its construction to ignite flammable vapour shall be placed or carried on a road tanker, unless it is permanently fixed to a part of the road tanker which is not likely to come into contact with flammable vapour.
- 8.3.3 No explosive substance or article capable of causing a fire or explosion, including matches and cigarette lighters shall be placed on the road tanker.
- 8.3.4 Mobile phones and pagers carried by the driver and attendant shall be switched off during the loading and unloading of LPG. This, however, shall not prevent the use of the mobile phone at a safe distance from the vehicle in emergency or inside the driver’s cab during the delivery journeys.

## **8.4 Certain Equipment to be Carried On The Road Tanker**

- 8.4.1 One fire extinguisher should be provided in the cab of the vehicle having a minimum test fire rating of 21B (BS 5423) such as 2kg of dry powder to be used as a first defence against a fire in the engine compartment. Two fire extinguishers should be provided on the vehicle adjacent to the carrying vessel, suitably protected from the weather and having a minimum test fire rating of 144B (BS 5423) such as 9kg dry powder. A label with Fire Services Department (FSD)

registered contractor number, FSD Form FS251 serial number, maintenance and expire date should be affixed on the fire extinguishers.

8.4.2 Not less than 2 signs each displaying a notice, in letters and characters not less than 120 millimetres in height, stating the words “NO SMOKING” in English and Chinese languages. The signs shall be prominently displayed near the tanker when discharging LPG.

8.4.3 No less than one set of protective goggles, or other suitable equipment for the protection of eyesight, and gloves for each person employed on the road tanker

8.4.4 No less than 4 road cones shall be carried on the road tanker.

8.4.5 Communication equipment such as mobile phone or radio telephone shall be provided on the road tanker.

## **8.5 Loading and Unloading Operations**

### **8.5.1 General**

8.5.1.1 Written loading and unloading procedures including emergency action should be available and understood by the driver and attendant and their responsibilities clearly defined.

8.5.1.2 Protective gloves and eye protection shall be worn when carrying out the loading or unloading operation and particularly when connecting and disconnecting LPG connections.

8.5.1.3 Persons engaged in loading and unloading of LPG shall wear suitable protective clothing to avoid frostbite which can occur if LPG comes in contact with unprotected skin.

8.5.1.4 Bulk tank and road tanker vessel, shall be filled in accordance with Gas Safety (Gas Supply) Regulation 10 which states that a bulk tank shall not be full of LPG at a temperature of 52.5°C. As a rule of thumb, bulk tanks and road tanker vessels shall not be filled more than 85% of the tank volume.

8.5.1.5 A reporting procedure shall be instituted to record every near miss, incident and accident which occurred during the operation of a road tanker. This may include traffic accident, LPG release, equipment failure or personal injury, etc.

8.5.1.6 Each person employed on a road tanker shall, at all times when LPG is being loaded into or discharged from the tanker:

- a) be not more than 50 meters from the tanker; and
- b) have ready access to the tanker.

**Note:** In the case of extended fill-connection, the driver shall stay close to the road tanker to monitor unloading while the attendant shall monitor the filling in progress at the LPG tank.

## **8.5.2 Daily Safety Pre-Trip Checks**

- 8.5.2.1 To ensure that road tankers are in a safe condition to operate, the following daily pre-trip safety checks shall be carried out before operating the road tanker.
- a) The pumps, pipes and fittings, excess flow valves, pressure relief valves, check valves and hoses should be visually checked for leaks, external damage and loosening of connections.
  - b) Equipment that are essential for safety such as, brakes, horn, wiper, lights, tyre, etc. shall be checked.
  - c) Check that the safety equipment as listed in 8.4 are present and visually check that they are in good condition.
  - d) The anti-static chain shall be checked for adequate length. (if applicable)
  - e) The operation of the tele-communication equipment shall be checked.
  - f) A visual inspection of the LPG transfer hoses shall be carried out.
- 8.5.2.2 A record of the checks shall be kept for two years and any defect or abnormality identified shall be rectified before operating the road tanker.

## **8.5.3 Loading to Road Tanker**

- 8.5.3.1 The vehicle shall be positioned at the designated loading area facing the egress and within easy reach of the transfer connections. The hand brake shall be firmly applied, and gears disengaged and the engine stopped (except where it is necessary for driving a vehicle mounted pump). The chock blocks shall be securely fitted to the undersides of the wheels. The electrical master switch shall be switched off.
- 8.5.3.2 The vehicle egress shall be kept clear of obstructions at all times.
- 8.5.3.3 Personal protective equipment such as protective gloves, goggles shall be worn.
- 8.5.3.4 The electrostatic bonding connection shall be made between the tanker and the fixed installation before the LPG lines (liquid and vapour, if applicable) are connected and not removed until after the LPG lines have been disconnected.
- 8.5.3.5 Check shall be made to ensure that transfer couplings are properly connected without use of undue force before loading and check again for any sign of leakage as transfer commences.
- 8.5.3.6 Level gauging of the receiving tanker shall be carried out during the loading operation, with whatever devices are provided, to ensure that the filling requirements of this Code of Practice are met.
- 8.5.3.7 Means shall be available to stop loading immediately when the maximum level in the receiving tanker is reached.



- 8.5.3.8 Checks shall be made to confirm there is no overfill by means of the fixed maximum level gauge before the vehicle leaves the loading bay.
- 8.5.3.9 If tanker is accidentally overfilled the excess LPG shall be removed in a safe manner as soon as possible and before departure of the vehicle in accordance with agreed procedures. See also 8.5.1.1.
- 8.5.3.10 After disconnection of loading lines, earthing connection, a final check shall be made that all tanker outlets are properly closed and secured and that the vehicle is in a fit condition to be driven away.

#### **8.5.4 Unloading from Road Tanker**

- 8.5.4.1 Unloading shall not be undertaken during the hours of darkness without adequate lighting.
- 8.5.4.2 The vehicle shall be positioned at the designated unloading bay on level ground as far as practicable and facing the egress. It shall be within easy reach of the transfer connection so that the hose is not under tension and at least one turn remains on the hose reel.
- 8.5.4.3 The vehicle egress shall be open and kept clear at all times.
- 8.5.4.4 The hand brake shall be firmly applied and the chock blocks securely fitted to the undersides of the wheels.
- 8.5.4.5 The warning signs as described in 8.4.2 shall be prominently displayed near the road tanker.
- 8.5.4.6 The fire extinguishers shall be placed at easily accessible positions.
- 8.5.4.7 The surrounding shall be checked to ensure that neither source of ignition nor flammable material is present.
- 8.5.4.8 Earthing/bonding cable shall be engaged before connecting the fill-hose and be disengaged after disconnecting the fill-hose. Earthing/bonding cable shall be connected during the entire unloading operation.
- 8.5.4.9 Fill connections and delivery hoses shall be visually checked for kinks and wear to ensure that they are in safe working conditions.
- 8.5.4.10 Hoses shall not be run across a public footpath or pavement for unloading unless there is no alternative. In such cases, the warning signs referred to in 8.4.2 shall be prominently displayed at either way of the crossing and the crossing shall be under the constant supervision of the driver/attendant before and during the unloading process as far as practicable.
- 8.5.4.11 Connections must be properly made without use of undue force before unloading and checks made for any sign of leakage as unloading commences. Any leakage shall be rectified before proceeding.

- 8.5.4.12 The storage capacity of the tank to be filled shall be carefully monitored throughout the filling operation by means of the content gauges to avoid over-filling.
- 8.5.4.13 Fill-connections and fill-hoses shall be checked for leakage throughout the operation.
- 8.5.4.14 The pumping rate shall be reduced as and when the maximum permissible level in the receiving tank is approached particularly when filling small tanks.
- 8.5.4.15 The delivery shall be stopped immediately when the maximum fill level in the receiving tanks is reached and isolating valves closed.
- 8.5.4.16 If a tank is accidentally overfilled, any excess LPG shall be removed as soon as possible in a safe manner. The tank must not be left in an unsafe condition. The driver shall notify his supervisor immediately in accordance with agreed procedures.
- 8.5.4.17 At the completion of a delivery, the following shall apply:
- a) All isolating valves on the tanker shall be closed.
  - b) All relevant static vessel fill line/vapour line valves shall be closed.
  - c) Delivery hoses shall be disconnected and stowed or reeled in, and protective caps (if available) re-attached.
  - d) The earth continuity wire shall be disconnected from the static vessel after the hose has been disconnected.
  - e) Fire extinguishers, chock blocks, notices, etc. shall be returned to the tanker.
  - f) The gate of the bulk installation shall be locked after verifying that the vehicle can be safe moved.

## **8.6 Emergency Tanker to Tanker Product Transfer**

- 8.6.1 All road tanker owners shall have arrangements for dealing with road tankers that have been involved in an accident or leaking LPG outside of the terminal to include full details of the arrangements for transporting LPG to another vehicle.
- 8.6.2 This would normally include a stand alone transfer facility mounted on a trailer which is capable of transferring LPG from a road tanker to another road tanker or a static storage tank.
- 8.6.3 In addition to the general requirements specified in 8.5 the following precautionary measures shall be applied.
- a) The transfer shall take place on essentially level ground and in the open air as far as practicable.

- b) Both vehicles shall be at least 15 metres from any source of ignition or occupied premises.
- c) Transfer shall not be undertaken during the hours of darkness without adequate and safe lighting.

8.6.4 When transferring LPG from one tanker to another the general principles applicable to "Unloading from Road Tanker" (8.5.4) shall be observed with the receiving tanker being regarded as the static vessel. Additional requirements are:

- (a) Both vehicles shall be suitably positioned for ease of transfer hose connection and shall be prevented from inadvertent movement.
- (b) Specific written emergency response procedures shall be written up with clear step-by-step procedures and include appropriate schematic diagrams. All possible accident scenarios with the tanker upright on its wheels, lying on either side or upside down, should be included.

## **8.7 Parking and Supervision of Vehicles**

8.7.1 The vehicle shall not be left unattended in the public highway at any time unless it is gas free. The vehicle may only be parked in a dedicated area which has been approved for the storage of LPG in bulk and/or the parking of LPG road tankers.

## **8.8 Report of Gas Emergency**

8.8.1 An accident in which there is significant damage to a gas vehicle, or loss of containment of LPG from such a vehicle is considered as a "major gas emergency".

8.8.2 Where there is a major gas emergency, the RGSC concerned shall:

- a) forthwith after it becomes aware of the emergency report the emergency to the Authority but, in any case, not later than the next working day after the day on which the emergency occurred;
- b) provide the Authority with such information and details in relation to the emergency as he requires; and
- c) not later than 28 days after the day on which the emergency occurred, furnish the Authority with a written report stating, so far as is reasonably practicable:
  - (i) the cause of the emergency; and
  - (ii) the actions which are or have been implemented to prevent, so far as is reasonably practicable, the recurrence of any similar emergency.

8.8.3 Following a major gas emergency happened on a road tanker, the owner of the vehicle shall not put back the vehicle into operation unless he has obtained the permission from the Authority to do so.

## **8.9 Change of Ownership**

- 8.9.1 Regulation 29 of the Gas Safety (Gas Supply) Regulations stipulates that the permit issued to the owner of a gas vehicle authorising its use for the transport of LPG in bulk on roads ceases to be valid on change of ownership of the vehicle. The new owner of the vehicle must therefore apply for re-issue of a new permit. The following specifies the procedures to obtain a replacement gas vehicle permit.
- 8.9.2 The existing owner of the vehicle shall inform the Authority in writing of the intention to transfer ownership of the vehicles giving details of the vehicle license numbers of the vehicles concerned and the proposed date on which the transfer will take effect; and return the current permits and the label to the Authority forthwith after the transfer of ownership.
- 8.9.3 The new owner of the vehicle shall submit an application for issue of a replacement permit at least 7 working days before the handover date. The application shall be accompanied by the prescribed fee as specified below:
- a) In case that the current vehicle permit is still valid on the handover date and there will be no material changes to the vehicle or the LPG facilities, no inspection of these vehicles shall be necessary and the expiry date on the replacement permits shall remain the same as that of the currently valid one. The application fee, in such case, is same as that for issue of duplicate permit or label as set out in Section 5 of Schedule 1 of the regulations.
  - b) In case that the handover takes place during the annual permit renewal process, the application shall be treated as a normal renewal application in accordance with the regulation 30. In such case, the application shall be submitted by the new owner. The fee for renewal of permit will be charged. No additional fee is necessary.
  - c) In case that the handover takes place after the current permit expires, the new owner shall apply for a new permit in accordance with the regulation 26. The fee for issue of new permit will be charged. No additional fee is necessary.
- 8.9.4 The Authority shall issue the replacement permit to the new owner of the vehicle upon receipt of the existing permit and label, the application fee and a copy of the vehicle registration document issued by Transport Department showing the new ownership of the vehicle. The replacement permit shall have the same effect as the original permit.

**APPENDIX A RELEVANT SECTIONS IN RELATION TO THE GAS SAFETY  
(GAS SUPPLY) REGULATIONS**

<b>Gas Safety (Gas Supply) Regulations</b>	<b>Relevant Sections in Module 3</b>	<b>Sections Quoted in Module 3</b>
Reg. 2: Interpretation	1	-
Reg. 10: Filling capacity of tanks and cylinders	4.1.1, 8.5.1.4, 8.5.4.12	4.7.5.3
Reg. 25: Only certain motor vehicles may carry liquefied petroleum gas	2.2, 2.3	2.2.1
Reg. 26: Application for and issue of permit	2.2, 2.3, 8.9.3	2.2.1
Reg. 29: Validity of permit	8.9.1	-
Reg. 34: Issue and display of label	8.2	8.2.1
Reg. 35: Alteration to gas vehicle	6.5	-
Reg. 36: Examination of gas vehicle	-	App. D
Reg. 38: Certain equipment to be carried on gas vehicle	5.5.4, 8.4.1, 8.4.2, 8.4.3, 8.4.4	8.4
Reg. 39: Only competent persons to be employed on gas vehicle	App. D	8.1
Reg. 40: Safety device to be used when LPG is discharged from road tanker	4.7.11	
Reg. 41: Special precautions against fire and explosion	8.3.1, 8.3.2, 8.3.3	8.3
Reg. 42: Inspection to be carried out by owner of gas vehicle	6	6.1, 6.2, 6.3

## APPENDIX B SPECIFICATION FOR SELECTING FIRE PROOF COATING FOR LPG VESSEL ON ROAD TANKERS

### 1. Fire Resistance

The coating should be able to afford fire protection to the vessel to prevent the release of any of the vessel contents (except release through the pressure relief valve), as a result of vessel failure when subject to:

- (a) A pool fire for 100 minutes; and
- (b) A jet fire for 30 minutes.

The verification of the tests should be in accordance with the USA Code of Federal Regulations Title 49 Section 179.18 or equivalent.

### 2. Corrosion

The coating material should not be detrimental to the protection of the vessel against corrosion. It should not induce nor support corrosion either by chemical reaction or by allowing the introduction of water.

### 3. Adhesiveness

The coating material should form a strong bond with the vessel surface, should remain intact during a fire and be able to withstand the erosive force imposed by a jet fire.

### 4. Compressive Strength

The coating material should have good compressive strength such that it should not spall off or crack when subject to vibration when the road tanker is in use. It should be resistant to abrasion and normal wear and tear and be resistant to spillage of petroleum products.

### 5. Repair & Maintenance

The coating material should be repairable so that the integrity of the coating can be restored where damage has occurred.

### 6. Detection of Disbonding and Corrosion

The method by which any areas of disbonding between the vessel and the coating interface and any associated corrosion can be detected, shall be specified.

### 7. Industrial Safety

- (a) The coating material should not be asbestos based.
- (b) No toxic smoke nor fumes should be generated when the coating is subject to heat.

**APPENDIX C A LIST OF RECOMMENDED DESIGNATIONS IN ENGLISH AND CHINESE FOR LPG PIPING SYSTEMS ON ROAD TANKERS**

<u>English</u>		<u>Chinese</u>
Bleed Valve		放氣閥
Bypass Valve		分流閥
Drain Valve		排放閥
Inlet Valve		入口閥
Liquid Valve		液體閥
Outlet Valve		出口閥
Pressure Gauge		壓力計
Pump		泵
Thermometer		溫度計
Vapour Valve		氣體閥

## APPENDIX D SYLLABUS OF TRAINING FOR DRIVERS AND ATTENDANTS OF LPG ROAD TANKERS

This syllabus is regarded as a minimum for LPG road tanker drivers and attendants.

### 1. Product Knowledge

At the completion of this unit the driver and attendant should have an understanding of the products distributed by his company and an awareness of the hazards involved in their transportation.

Product knowledge should include:

- (a) Nature and manufacture of company products.
- (b) Characteristics and hazards in the handling of different products.
  - (i) Flammable Hazards: Ignition, temperature, flammable limits, vapour pressure and any others relevant to the products.
  - (ii) Other Hazards: Inhalation, aspiration, ingestion or direct contact with the products.
  - (iii) Effects on environment: Toxicity of products.
  - (iv) Other properties including liquid and vapour density and any others relevant to the products.

### 2. Tanker Knowledge

At the completion of this unit the driver and attendant should have an understanding of the vehicles used by his company and the equipment associated with them. He should also be aware of the vehicle handling characteristics when carrying LPG.

The tanker knowledge should include:

- (a) Basic design and construction of company tankers and when appropriate specific information on the vehicle most likely to be used by the driver.
- (b) The operation of the vehicle, its P&I diagram, its associated equipment and an understanding of the potential hazards in their use.
  - (i) Valves, hoses, contents and fixed liquid gauges and other relevant items.
  - (ii) Pumps, compressors, power take off equipment and other ancillaries.
- (c) Emergency and fire equipment provided with the tanker.
- (d) The effects of surge of bulk liquids on the handling of a tanker during cornering, braking and acceleration.

### 3. Operating Procedures

At the completion of this unit the driver and attendant should have an understanding of the company procedures for operating his tanker and the potential hazards involved in those operations. There may also be local



regulations affecting his particular terminal in which he should receive specific instruction.

Operating procedures should include:

- (a) Loading and unloading:
  - (i) Standard procedures, potential hazards including overfilling and anti tow-aways.
  - (ii) Action to be taken in the event of an accident, spillage or fire.
  - (iii) Ensuring that the tanker is safe before loading and unloading, the permissible load is not exceeded and the vehicle vessel is not overfilled.
- (b) Checks before commencing any journey, the driver and attendant should ensure that:
  - (i) Information is provided in writing about the load to be carried and any action to be taken in the event of an emergency or accident.
  - (ii) Appropriate fire and safety equipment is in good order.
  - (iii) Documentation provided, agrees with instructions and warning panels provided.
  - (iv) There are no leaks and all relevant valves are properly closed.
- (c) Static electricity:
  - Causes and potential hazards. Minimising hazards. Earthing.

#### **4. Fire Prevention, Control and Safety**

At the completion of this unit, the driver and attendant should have an understanding of how fires are caused, their prevention and control and be able to use the fire extinguishers provided with his vehicle.

Fire prevention, control and safety should include:

- (a) Nature of Fire: Theory of combustion. Classification of fires. Identification of potential hazards and ignition sources. Types of fire fighting media.
- (b) Extinguishers: Use of dry, powder extinguishers.
- (c) Practical use of extinguishers: Briefing for a practical fire fighting exercise. Individual practice in dealing with simple fires.
- (d) Companies may provide other safety equipment or protective clothing and the driver and attendant should receive instruction in their use.

#### **5. Emergency Procedures**

At the completion of this unit the driver and attendants should understand his responsibilities in an emergency and what actions he must take.

Emergency procedures should include:

- (a) Emergencies and accidents: Alerting the Emergency Services. Actions to contain the emergency. Specific actions in the event of spillage and/or fire. First aid in the event of injury.
- (b) Emergency Services: Responsibilities of the Emergency Services. Liaison with Emergency Services. Notification of accidents.

## **6. First Aid in Emergency**

At the completion of this unit the driver should be able to provide a prompt response to situations where people may be injured, in immediate danger or involved with an emergency concerning his tanker.

They should be encouraged to undertake training in basic first aid & cardiopulmonary resuscitation (CPR). As a minimum requirement, they must be capable of:

- (a) Removal of a casualty from immediate danger
- (b) Care of an unconscious casualty
- (c) Control of bleeding

## **7. Legislation And Codes of Practice**

At the completion of this unit the driver and attendant should have an understanding of the legal requirements for the conveyance of products supplied by his company and the responsibility of the company and himself in meeting these requirements.

Legislation and Codes of Practice should include:

### (a) Gas Safety (Gas Supply Regulations):

- Regulation 34 : Requires the display of valid label on road tankers
- Regulation 36 : Requires the driver to produce the road tanker for inspection by a gas safety inspector or police officer as and when required
- Regulation 38 : Certain equipment to be carried on gas vehicle
- Regulation 39 : The need for specialised training for drivers and attendants; display of relevant signs and adequate supervision when discharging
- Regulation 40 : The use of certain safety device when discharging
- Regulation 41 : Special precautions against fire and explosion
- Regulation 42 : Requires certain inspections to be carried out

### (b) Company Procedures

- (c) Code of Practice for LPG Industry in the Hong Kong Special Administrative Region, Module 3 - Handling and Transport of LPG in Bulk by Road.

## 8. **Refresher Training**

Road tanker drivers and attendants shall receive the appropriate refresher training and emergency drills necessary to maintain the required knowledge and skill level. It is recommended that at least the equivalent of one day training per year shall be conducted for each driver and attendant. This may include transport related emergency drills which must be performed at least once a year. Where the scenario used makes it impractical to undertake full scale exercise, desk top exercise may be performed instead.

# **HAZCHEM CODE PLATE**

## APPENDIX E



**TYPICAL HAZCHEM CODE PLATE**  
**800 (W) x 600 (H) mm**

## APPENDIX F TRANSPORT EMERGENCY CARD FOR LPG ROAD TANKERS

Substance Identification Number for LPG - 1075

Emergency Action Code - 2WE

<b>CARGO</b>	Liquefied Petroleum Gas, Commercial to BS 4250 Colourless, normally odourised liquefied gas under pressure.
<b>NATURE OF HAZARD</b>	Highly flammable. Spilled liquid is very cold and vaporises very rapidly except in extreme cold weather and may create a visible white cloud.  The gas is invisible, heavier than air and spreads along the ground.  Even small amounts can form a flammable mixture with air.  Heat will cause pressure to rise in the vessel and may cause the relief valve to open and ignition of the discharge. In extreme cases there is a risk of bursting and explosion.  LPG, particularly liquid can cause severe frost burns if brought into contact with the skin.
<b>PROTECTIVE DEVICES</b>	Complete eye protection e.g. goggles or visor. Plastic gauntlets.

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### EMERGENCY ACTION - NOTIFY EMERGENCY SERVICES IMMEDIATELY

<b>ROAD ACCIDENT OR SPILLAGE</b>	If possible move vehicle to open ground. Stop vehicle engine. No naked lights. No smoking. No unsafe electrical equipment. e.g. radios. Turn electrical master switch OFF if without risk. Check for leaks. Shut off leaks if without risk. Keep public away from possible danger area. Contain leaking liquid with sand or earth. Prevent liquid entering drains, basements and workpits. Vapour may create a flammable atmosphere. Keep upwind.
<b>FIRE</b>	Stop vehicle engine. Turn electrical master switch OFF if without risk. Keep public away from possible danger area Do not extinguish a leaking gas flame unless absolutely necessary. If exposed to fire, keep vehicle vessel cool by using water spray if water is available. Do not use water jet for extinguishing fire.

**FIRST AID**      Wet contaminated clothing first, then remove as soon as possible.

Remove the injured from immediate danger

Seek medical treatment when anyone has symptoms apparently due to inhalation or contact with skin or eyes.

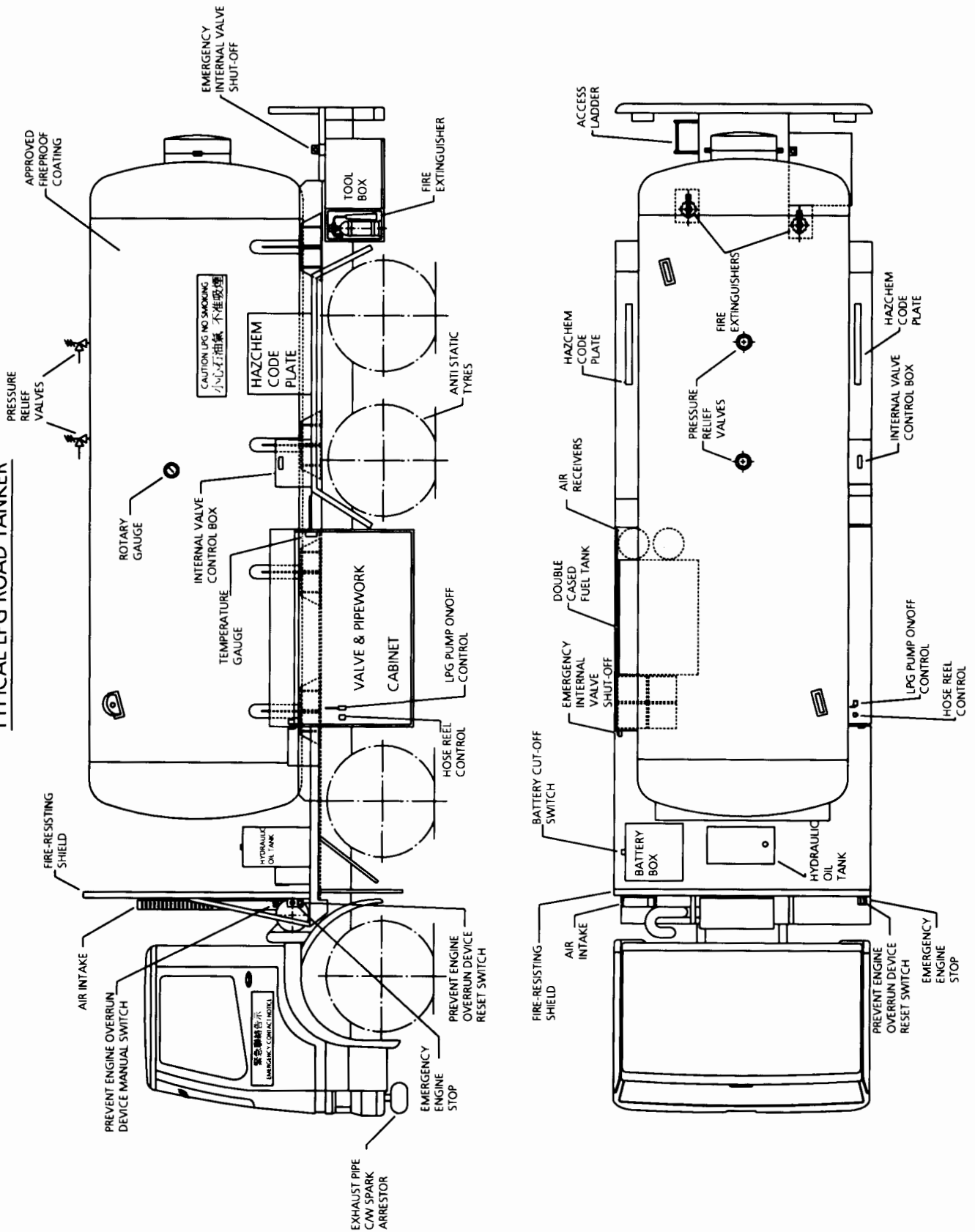
**EMERGENCY  
TELEPHONE  
CONTACT**      \_\_\_\_\_

# TYPICAL ROAD TANKER DIAGRAMS

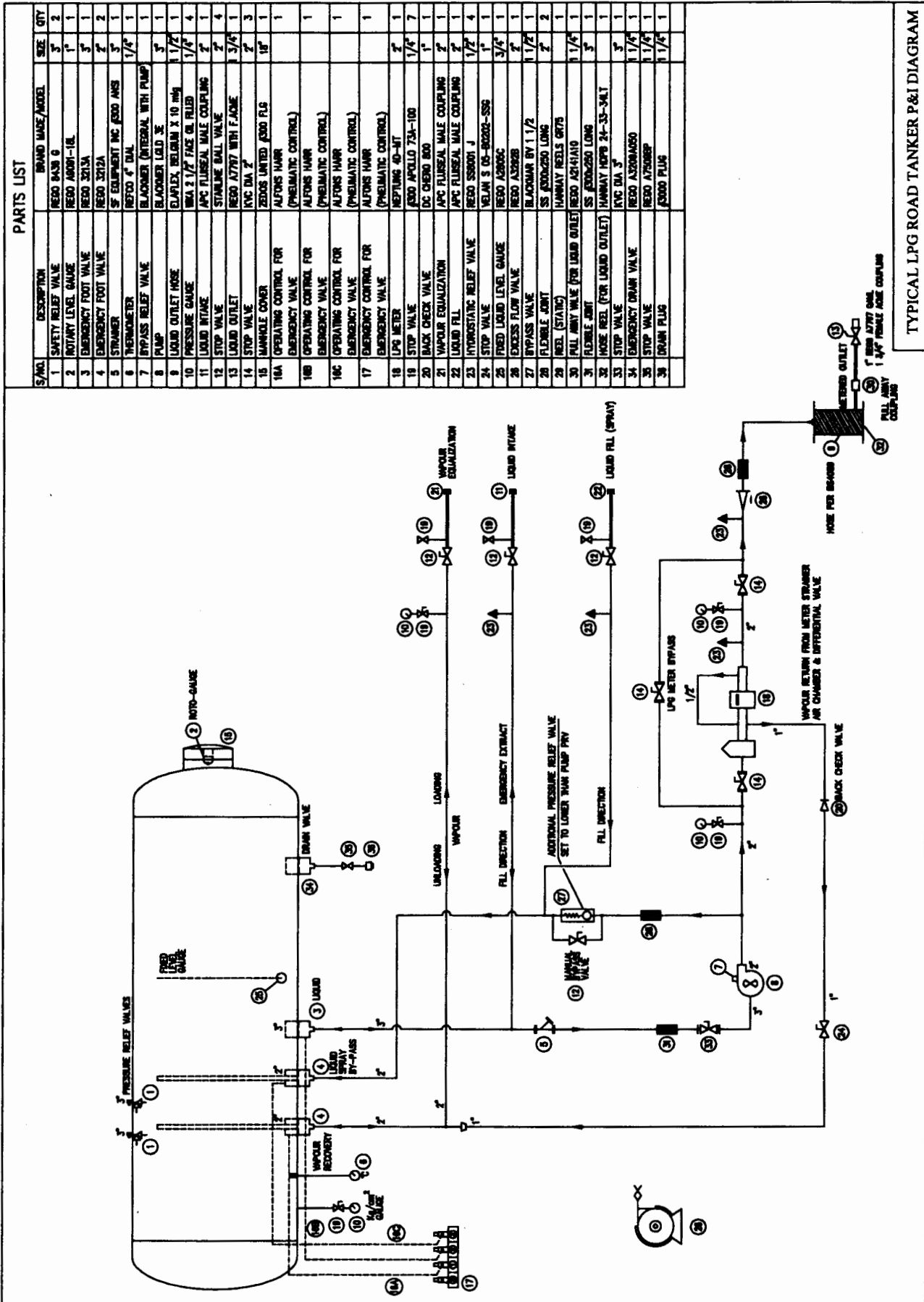


# APPENDIX G

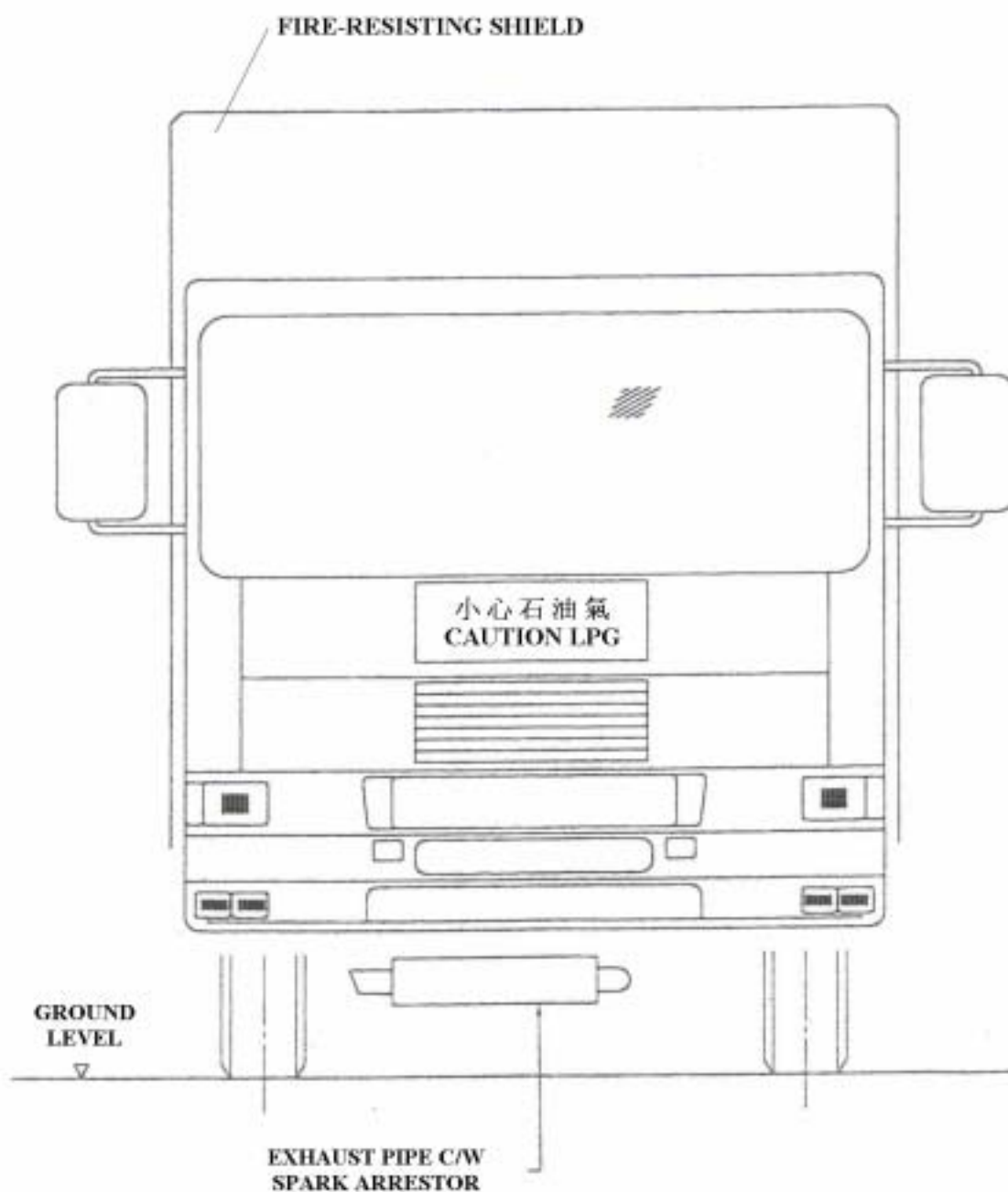
## TYPICAL LPG ROAD TANKER



APPENDIX G

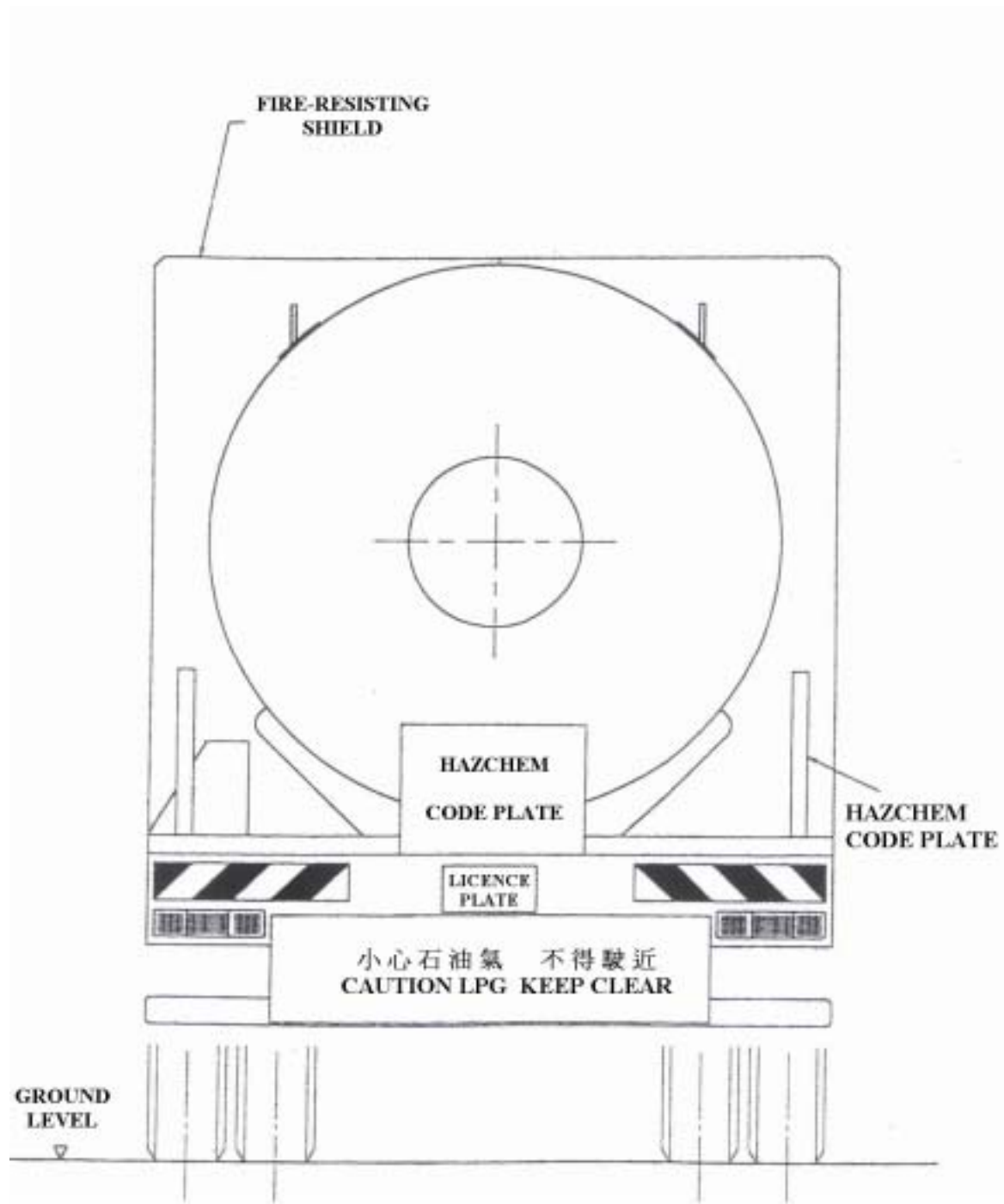


## APPENDIX G



### TYPICAL FRONT VIEW

# APPENDIX G



## TYPICAL REAR VIEW

## **APPENDIX H GUIDELINES FOR ADMINISTERING ALCOHOL TESTS ON COMPETENT PERSONS EMPLOYED ON LPG ROAD TANKERS**

### **1. Types of alcohol tests required**

Use of alcohol by competent persons (Drivers and Attendants) is forbidden & under no circumstances are they to be allowed to continue with their duties if they have consumed alcohol. Alcohol tests are therefore required to be carried out in accordance with the following guidelines.

(a) Random tests: These are to be conducted on a random, unannounced basis just before, during or just after work. The minimum number of random tests conducted each month shall be equal at least 10% of the total number of drivers and attendants combined, with all drivers and attendants tested at least once per year.

(b) Reasonable suspicions: These are to be conducted whenever a supervisor or company official observes behaviour which gives the appearance of alcohol misuse, or where alcohol can be detected on the breath.

### **2. Performing alcohol tests**

Tests may be carried out using an evidential breath testing (EBT) device, with a print out function, as approved by the National Highway Traffic Safety Administration (NHTSA), USA. Any individual who conducts the testing must be trained to operate the breath testing device, which shall be calibrated regularly to ensure accuracy, in accordance with the manufacturer's recommendations.

Currently, the Hong Kong Police uses 'Alcotest 7110' manufactured by Drager, Lubeck, Germany as its breath testing device. Some companies are using the 'Alcotest 7410' manufactured by Drager, Lubeck, Germany. Both are acceptable devices for the purpose.

### **3. Consequences of alcohol misuse**

Where any level of alcohol is detected in a person tested, he shall be immediately suspended from duty. The RGSC concerned shall then follow its normal disciplinary procedures for dealing with such matters. In any event, the person concerned shall not be permitted to return to duty for 24 hours.

Where a road tanker driver is in charge of his vehicle outside the terminal and is found to have an alcohol level of 22 micrograms or more of alcohol in 100 millilitres of breath, the Police shall be informed.

### **4. Written records to be kept by RGSCs**

RGSCs or road tanker owners shall submit quarterly summary report to the Gas Standards Office for all drivers and attendants. The report shall be submitted within 14 days of the end of each quarter in March, June, September and December. The required format for the report is shown as below:

**Example:**

**Result of Alcohol Test for 4<sup>th</sup> Quarter of 2003**

Place where test is conducted	Result	OCTOBER		NOVEMBER		DECEMBER	
		Pass	Fail	Pass	Fail	Pass	Fail
Driver on road		1	0	0	0	0	0
Driver in terminal		0	0	1	0	2	0
Attendant on road		1	0	0	0	0	0
Attendant in terminal		0	0	0	1	0	0
Total		2	0	1	1	2	0

Remark:

Pass = Zero alcohol concentration detected

Fail = Alcohol concentration greater than 0 detected

Other information to be provided:

Details of case where any driver or attendant failed the test. This would normally include alcohol concentration detected, action taken, suspension, dismissal, report to police, etc.

**RECORDS OF COMPETENT PERSON  
EMPLOYED ON LPG ROAD TANKER**

**FORM 113, FORM 113 ANNEX,  
AND FORM 114**

**APPENDIX I**

**表格 113  
FORM 113**

香港特別行政區政府

THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

氣體安全(氣體供應)規例(第51章)

GAS SAFETY (GAS SUPPLY) REGULATIONS, CAP.51

受僱在石油氣缸車上工作的勝任人士的記錄

RECORD OF COMPETENT PERSON EMPLOYED ON LPG ROAD TANKERS

只供本署使用:  
For Official Use Only:

檔案編號  
GasSO Reference

收件日期  
Date of Receipt

本表格會用作受僱在石油氣缸車上工作的勝任人士的正式記錄。本表格須由勝任人士所屬的註冊氣體供應公司填寫及簽署。請細閱第四頁的‘注意事項’，並以正楷填寫表格各欄。

This form is to be used as a formal record of competent persons (CPs) employed on road tankers used to convey liquefied petroleum gas (LPG) in bulk on roads. It should be completed and signed by the Registered Gas Supply Company (RGSC) that the CP works for. Please read the ‘Important Notes’ on page 4 carefully and complete all items in BLOCK letters.

**甲部 - 個人資料 SECTION A - PERSONAL PARTICULARS**

此部份應由申請成為勝任人士本人填寫。

This section should be completed by the person who applies to become a Competent Person.

- (1) 姓名(中文): \_\_\_\_\_ (2) 姓名(英文): \*先生/女士  
Name (in Chinese): \_\_\_\_\_ Name (in English): \*Mr./ Ms. \_\_\_\_\_
- (3) 香港身分證號碼: \_\_\_\_\_ (4) 出生日期: \_\_\_\_\_  
HKID Card No.: \_\_\_\_\_ Date of Birth: \_\_\_\_\_
- (5) 你是否曾經申請成為受僱在缸車上工作的勝任人士? \* 是 / 否  
Have you previously applied for registration as a Competent Person? \* Yes / No
- (6) 若(5)答‘是’，請填寫氣體標準事務處檔案編號: \_\_\_\_\_  
If (5) is ‘Yes’, please state GasSO reference no.: \_\_\_\_\_ GSO/GPS/52/04/ \_\_\_\_\_

以下各部份應由勝任人士所屬的註冊氣體供應公司填寫。

The following sections should be completed by the RGSC that the CP belongs to.

**乙部 - 僱用詳情 SECTION B - DETAILS OF EMPLOYMENT**

- (7) 工作性質: Nature of Work:  司機 Driver  跟車 Attendant
- (8) 開始履行上述職務的日期: \_\_\_\_\_  
Date of Commencing the Duties: \_\_\_\_\_
- (9) 若(7)答‘司機’，上述人士是否持有駕駛中型或重型貨車類別的有效駕駛執照? \* 是 / 否 / 不適用  
If (7) is ‘Driver’, does he/she possess a valid driving licence of appropriate class to drive a medium/heavy goods vehicle? \* Yes / No / N.A.
- (10) 僱主名稱: Name of Employer: \_\_\_\_\_
- (11) 註冊氣體供應公司名稱:(若與(10)所填寫的不同)  
Name of the RGSC: (If different from (10) above) \_\_\_\_\_
- (12) 註冊氣體供應公司負責人姓名及職位:  
Name & Post of the RGSC’s Responsible Person: \_\_\_\_\_
- (13) 通訊地址: \_\_\_\_\_  
Correspondence Address: \_\_\_\_\_
- (14) 聯絡電話: Contact Tel.: \_\_\_\_\_ (15) 傳真號碼 Fax. No.: \_\_\_\_\_



# APPENDIX I

## 丙部 - 訓練及經驗 SECTION C - TRAINING AND EXPERIENCE

有關以下訓練項目最低要求的詳情，請參閱英國石油氣協會工作守則二及香港石油氣業工作守則單元三。

For details of the minimum requirements of each training item below, please refer to LP Gas Association Code of Practice 2, and Code of Practice for HK LPG Industry Module 3.

(16) 上述人士是否已經完成以下基本訓練? Did this person complete the following areas of basic training?	時間 (小時) Duration (hrs.)	†主辦機構 Organizer	預計完成日期 Proposed Completion Date
(a) 有關石油氣的知識 Knowledge of LPG	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
(b) 防止火警、控制火警及消防安全 Fire Prevention, Control and Safety	* 是 / 否 * Yes / No	<input type="checkbox"/> 消防處 Fire Services Department <input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
(c) 對缸車的認識 Road Tanker Knowledge	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
(d) 緊急程序 Emergency Procedures	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
(e) 運作程序 Operating Procedures	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
(f) 緊急事故的急救方法 First Aid in Emergency	* 是 / 否 * Yes / No	<input type="checkbox"/> 香港紅十字會 H.K. Red Cross <input type="checkbox"/> 香港聖約翰救護機構 H.K. St. John Ambulance <input type="checkbox"/> 其他 Other: _____	_____
(g) 規例及工作守則 Regulations and Codes of Practice	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
其他 Other: _____	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
其他 Other: _____	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____
其他 Other: _____	* 是 / 否 * Yes / No	<input type="checkbox"/> 註冊氣體供應公司 RGSC <input type="checkbox"/> 其他 Other: _____	_____

若以上任何一項答案為‘否’，有關註冊氣體供應公司應註明該訓練項目的預計完成日期。除非有合理解釋，所有未完成的訓練項目須於提交本表格後三個月內完成，並須在完成訓練後以書面通知當局。

If the answer of any of the above items is 'No', please state when such training will be completed. The completion date shall be **not later than 3 months** from the submission date of this form unless satisfactory justifications are given. The RGSC shall also notify the Authority in writing once the outstanding training is completed.

## APPENDIX I

(m) 上述人士是否曾參與以下實際訓練及演習?

Did this person attend the following practical training/drill?

(h) 紅車緊急事故或火警演習  
Road Tanker Emergency/Fire Drill

\* 是 / 否  
\* Yes / No

†主辦機構  
Organizer

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

(i) 紅車石油氣緊急回收演習  
Road Tanker Product Recovery Drill

\* 是 / 否  
\* Yes / No

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

(j) 使用紅車上的滅火筒  
Use of Fire Extinguisher on Road Tanker

\* 是 / 否  
\* Yes / No

消防處 Fire Services Department  
 註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

(k) 紅車裝卸程序實際訓練  
Practical Training on Product Loading/Unloading

\* 是 / 否  
\* Yes / No

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

(l) 防禦性駕駛訓練  
Defensive Driver Training

\* 是 / 否  
\* Yes / No

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

其他  
Other: \_\_\_\_\_

\* 是 / 否  
\* Yes / No

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

其他  
Other: \_\_\_\_\_

\* 是 / 否  
\* Yes / No

註冊氣體供應公司 RGSC  
 其他 Other: \_\_\_\_\_

(n) 上述人士是否曾經受僱為石油氣紅車司機或跟車? 若答‘否’，請細閱  
‘注意事項’ (2)。  
Was this person previously employed as an LPG road tanker \*driver  
/attendant? If the answer is ‘No’, please read the ‘Important Notes’ (2)  
carefully.

\* 是 / 否  
\* Yes / No

時間 (月/年)  
Period (Mth./Yr.)

僱主姓名  
Name of Employer

(o) 上述人士是否有下列相關的實際工作經驗?

Did this person have any of the following relevant practical experience?

- †  石油氣瓶車 \*司機或跟車 LPG cylinder wagon \*driver/attendant  
 其他危險物品貨車 \*司機或跟車 Dangerous goods vehicle \*driver/attendant  
 中型或重型貨車 \*司機或跟車 Heavy/medium goods vehicle \*driver/attendant  
 其他石油氣相關工作 Other LPG related work: \_\_\_\_\_

### 丁部 - 定期體格檢驗、藥物測試 SECTION D - REGULAR HEALTH AND FITNESS EXAMINATION & DRUG TESTS

(p) 上述人士是否曾在過去半年內接受體格檢驗，並獲註冊醫生證明適合受僱在紅車上工作?  
(如申報工作性質為司機，醫生須於體格檢驗報告上註明接受驗身人士在體格上是否適合駕駛  
中型或大型貨車)

\* 是 / 否  
\* Yes / No

上次驗身/測試的日期  
Date of Last Exam./Test

Was health and fitness examination conducted by a registered medical practitioner during the last 6  
months certifying that the person was physically fit to work? (For drivers, the doctor shall  
certify, on the report, if he/she is physically fit to drive a medium/heavy goods vehicle)

(q) 上述人士是否曾在過去半年內接受藥物測試，並獲註冊醫生證明沒有服用下述藥物的證據?  
(包括大麻、狂喜、海洛英、冰、鴉片)

\* 是 / 否  
\* Yes / No

Were drug tests conducted during the last 6 months certifying that there was no evidence of abuse  
of the drugs specified? (Including: Cannabis, Ecstasy, Heroin, Ice, Opium)

## APPENDIX I

### 戊部 - 聲明 SECTION E - DECLARATION

本人謹此聲明本表格內所載列的內容及附上之文件均真實無誤。

I hereby declare that all the particulars, statements and documents submitted in/with this form are true and correct.

(23) 勝任人士簽署

Signature of Competent Person \_\_\_\_\_

(24) 註冊氣體供應公司負責人簽署及公司蓋印

Signature of RGSC Responsible Person and Company Chop \_\_\_\_\_

(25) 日期 Date \_\_\_\_\_

### 己部 - 所需文件 SECTION F - REQUIRED DOCUMENTS

(26) 遞交申請書時，請一併附上以下文件的影印副本，並於空格內加上‘✓’號以作註明。

When you submit the application, please also submit the photocopies of the following documents and put a ‘✓’ in the appropriate box(es).

- †
- 完成訓練證明書或記錄 Training Attendance Certificates or Records
  - 體格檢驗報告 Health and Fitness Examination Report
  - 藥物測試報告 Drug Test Report
  - 有效的駕駛執照 (只適用於司機) Valid Driving Licence (for drivers only)
  - 過去三年的交通違例判罪及違例記分記錄 (只適用於司機)  
Traffic Conviction and Driving-offence Points Records in the past 3 years (for drivers only)

### 注意事項 IMPORTANT NOTES

- (1) 根據現行規定，所有註冊氣體供應公司均須以本表格向氣體安全監督提供其直接僱用，或經其授權承辦商僱用在石油氣缸車上工作的勝任人士的資料。該公司須在首次僱用有關勝任人士時，或在有關勝任人士停止於石油氣缸車工作超過一年後再獲僱用時，填寫本表格。本表格須在填妥後盡快遞交，不論在任何情況下，均須在開始有關工作後十四日內遞交。  
The Registered Gas Supply Company (RGSC) shall notify the Gas Authority, by using this form, the details of any competent person employed on the LPG road tankers it operates or that are operated by others on its behalf. This form shall be completed on first appointment of a CP, or on re-appointment of a CP who has ceased to work on an LPG road tanker for over 1 year. It shall be submitted as soon as possible, but in any case not later than 14 days from the date of commencing duty.
- (2) 註冊氣體供應公司必須確保在受僱前沒有石油氣缸車工作經驗的新司機或跟車，均在另一名氣體安全監督確認的勝任人士的監督下進行與石油氣有關的操作，直至監督豁免此限制為止。氣體供應公司可填妥及遞交表格 EMSD/GSO/113 附表 (一) 以申請該項豁免。詳情請參閱附表內的注意事項。  
For any new driver/attendant who does not have previous experience of carrying out work in relation to the operation of LPG road tankers, the RGSC MUST arrange this person to carry out the duties under supervision of a recognized CP until such time this condition has been waived by the Authority. The RGSC may seek approval for this by submitting a form, Annex (I) of EMSD/GSO/113. (Practical Experience Record Form). For details, please refer to the notes on the annex.
- (3) 如任何已註冊的勝任人士離職或不再擔任石油氣缸車司機或跟車的工作，所屬註冊氣體供應公司須於該事情發生後十四日內以書面將此事通知當局。  
If any CP ceases to be employed as an LPG road tanker driver/attendant, the RGSC shall inform the Authority of such fact in writing within 14 days thereafter.
- (4) 註冊氣體供應公司須每年為每位受僱的勝任人士填妥及遞交表格 EMSD/GSO/114 (受僱在石油氣缸車上工作的勝任人士的每年更新記錄)，藉以更新個人資料，及記錄過去一年所接受的訓練及應變演習。詳情請參閱表格內的注意事項。  
The RGSC shall submit a form, EMSD/GSO/114 (Annual Record Update for Competent Person Employed on LPG Road Tankers), once in every year for each of its CPs for updating their personal particulars, and training or drills attended during the previous year. For details, please refer to the notes on the form.
- (5) 註冊氣體供應公司須為每位受僱的勝任人士安排最少每兩年一次的體格檢驗，及最少每年一次的藥物測試。此外，註冊氣體供應公司亦須根據當局發出的指引，為勝任人士進行酒精濃度測試。  
The RGSC shall arrange health and fitness examination once in every 2 years, and drug tests once in every year for each of its CPs as a minimum requirement. In addition, the RGSC shall conduct the required alcoholic tests for the CPs in accordance with the guidelines issued by the Authority.

## APPENDIX I

### 遞交申請方法 SUBMISSION OF APPLICATION

- (1) 申請表格可送交或郵寄「香港銅鑼灣加路連山道98號616室機電工程署氣體標準事務處氣體安全監督」。申請表格如為影印本或以傳真方式遞交，概不受理。  
This application form shall be submitted, by hand or mail, to 'The Gas Authority, Gas Standards Office, Room 616, Electrical & Mechanical Services Department, 98 Caroline Hill Road, Causeway Bay, Hong Kong'. Photocopy or facsimile of this form will not be accepted.
- (2) 申請可經由電子方式提交，詳情請瀏覽：「<http://www.info.gov.hk/emsd/submission>」  
Application may be submitted electronically. For details, please refer to: 「<http://www.info.gov.hk/emsd/submission>」
- (3) 如有疑問，請向香港銅鑼灣加路連山道98號機電工程署氣體標準事務處查詢（電話號碼：2808 3683）。  
Enquiries can be directed to the Gas Standards Office, EMSD, 98 Caroline Hill Road, Causeway Bay, Hong Kong (Tel. 2808 3683).

### 個人資料的說明 NOTES ABOUT PERSONAL DATA

- (1) 本申請表格所收集的個人資料，政府會用於以下用途：  
The personal data collected by means of this form will be used by the Government for the following purposes:
  - (a) 評估你的資歷，以確定你是否合資格加入所申請的勝任人士名單內；及  
to assess your qualifications in order to determine your eligibility for inclusion in the List of Competent Persons for each class you apply for; and
  - (b) 方便政府日後和你通訊。  
to facilitate future communication between the Government and you.

如你未有提供足夠資料，本署將無法處理你的申請。你的個人資料將存於機電工程署，並會向本署的資料使用者披露。公眾可查閱你的名字及聯絡資料。根據個人資料（私隱）條例第18及第22條，以及附表1第6原則的規定，你有權查閱及改正個人資料。你的查閱權利包括索取本申請表格上所載個人資料的副本。若有任何關於本表格所收集個人資料的查詢，包括要求查閱及改正資料，請向氣體安全監督提出。

If you do not provide sufficient information, we may not be able to process your application. Your personal data will be kept at the Electrical and Mechanical Services Department and be disclosed to the data users of the Department. Your name and contact details may be disclosed to the public for their information. You have a right of access and correction with respect to personal data as provided for in sections 18 and 22 and Principle 6 of Schedule 1 of the Personal Data (Privacy) Ordinance. Your right of access includes the right to obtain a copy of your personal data provided by this application form. Enquiries concerning the personal data collected by means of this application form, including the making of access and corrections, should be addressed to the Gas Authority.

**APPENDIX I**

表格 113 - 附件 (一)  
FORM 113 - ANNEX (I)

受僱在石油氣缸車工作的勝任人士的紀錄  
RECORD OF COMPETENT PERSON EMPLOYED ON  
LPG ROAD TANKERS  
實際經驗紀錄表  
PRACTICAL EXPERIENCE RECORD FORM

只供本署使用： For Official Use Only:
GasSO Reference GSO/GPS/52/04/ _____
Date of Receipt

- 註： (一) 本表格應由註冊氣體供應公司或其授權承辦商，為每名受僱前沒有石油氣缸車工作經驗的新司機/跟車工人填寫。在使用本表格前，須先遞交表格 EMSD/GSO/113。
- (二) 有關公司可使用本表格，在甲部記下由司機/跟車工人負責運送的車程，以證明其聘用的新司機/跟車工人已依照氣體安全(氣體供應)規例的規定，取得足夠的實際經驗。
- (三) 本表格應於司機/跟車工人接手工作不少於3個月後提交，屆時，該司機/跟車工人應至少曾負責缸車的30次運送車程。在這段期間，司機/跟車工人必須在一名成功在氣體標準事務處註冊的勝任的人的監督下工作。這名負責監督工作的勝任的人的姓名必須記錄於本表格內。
- (四) 本表格的甲部須由司機/跟車工人填寫，而乙部則須由所受聘的註冊氣體供應公司或其授權承辦商填寫。
- (五) 本表格應送交香港加路連山道98號機電工程署氣體標準事務處。
- Notes: (1) This form should be completed by the Registered Gas Supply Company (RGSC), or its authorized contractor, for each of the new drivers/attendants, who does not have previous experience of working on an LPG road tanker. A Form EMSD/GSO/113 must first be sent before using this form.
- (2) This form is to be used by the company to evidence that the new driver/attendant it employed has acquired substantial practical experience as required in the Gas Safety (Gas Supply) Regulations by keeping log of the delivery journeys carried out by the driver/attendant on SECTION A of this form.
- (3) This form should be submitted not less than 3 months after the driver/attendant takes up his/her duties, and by the time, at least 30 number of road tanker delivery journeys should have been carried out by the driver/attendant. During this period, the driver/attendant must carry out his/her duties under the supervision of a Competent Person, who has been successfully registered by the Gas Standards Office. The name of this supervising Competent Person shall be recorded on this form.
- (4) SECTION A of this form shall be completed by the driver/attendant, whereas SECTION B shall be completed by the RGSC or its authorized contractor, that he/she works for.
- (5) This form should be sent to the Gas Standards Office, Electrical and Mechanical Services Department, 98 Caroline Hill Road, Hong Kong.

甲部 - 由司機/跟車工人負責運送石油氣的車程紀錄

SECTION A - RECORDS OF LPG DELIVERY JOURNEYS CARRIED OUT BY THE DRIVER/ATTENDANT

地點 Site location	日期 Date	時間 Time	負責監督工作的 勝任人士的姓名 Name of Supervising Competent Person
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			

# APPENDIX I

## 甲部(續) SECTION A (Cont'd)

地點 Site location	日期 Date	時間 Time	負責監督工作的 勝任人士的姓名 Name of Supervising Competent Person
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

開始工作日期 Date of Commencing Duty: \_\_\_\_\_

本人謹此聲明本表格所載的所有資料均真確無誤。

I hereby declare that all the information contained in this form are true and correct.

勝任人士的姓名 Name of Competent Person \_\_\_\_\_

勝任人士的簽名 Signature of Competent Person \_\_\_\_\_

## 乙部 - 聲明 SECTION B - DECLARATION

本人認為上述司機/跟車工人\*已有足夠的實際經驗，能妥善執行其有關石油氣缸車運作的工作，現謹此要求批准豁免先前要求此名司機/跟車工人\*在工作時由一名勝任人士予以監督的條件，並正式把其姓名列入勝任人士的名單內。

I am of the view that the above named driver/attendant\* has acquired sufficient practical experience to carry out his/her duties in relation to the operation of an LPG road tanker in a competent manner, and hereby seek approval for waiving the previous condition of requiring this driver/attendant\* to be supervised by a Competent Person when carrying out the duties; and formally including his/her name in the List of Competent Person.

姓名及職位 Name & Post \_\_\_\_\_

簽名及公司印鑑 Signature & Company Chop \_\_\_\_\_

註冊氣體供應公司名稱  
Name of Registered Gas Supply Company \_\_\_\_\_

日期 Date \_\_\_\_\_

APPENDIX I

表格 114  
FORM 114

香港特別行政區政府

THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

氣體安全(氣體供應)規例(第51章)

GAS SAFETY (GAS SUPPLY) REGULATIONS, CAP. 51

受僱在石油氣缸車上工作的勝任人士的每年更新記錄

ANNUAL RECORD UPDATE FOR COMPETENT PERSON EMPLOYED

ON LPG ROAD TANKERS

只供本署使用: For Official Use Only:
檔案編號 GasSO Reference
收件日期 Date of Receipt

本表格會用作受僱在石油氣缸車上工作的勝任人士的每年更新記錄。註冊氣體供應公司應為其僱用的勝任人士每年填寫並簽署本表格一次。註冊氣體供應公司在使用此表格前須先填寫表格 EMSD/GSO/113。請細閱第三頁的‘注意事項’，並以正楷填寫表格各欄。

This form is to be used as an annual record update of competent persons (CPs) employed on road tankers used to convey liquefied petroleum gas (LPG) in bulk on roads. It should be completed annually and signed by the Registered Gas Supply Company (RGSC) that the CP works for. The RGSC shall have completed Form EMSD/GSO/113 before using this form. Please read the 'Important Notes' on page 3 carefully and complete all items in BLOCK letters.

甲部 - 個人資料 SECTION A - PERSONAL PARTICULARS

此部份應由申請成為勝任人士本人填寫。

This section should be completed by the person who applies to become a Competent Person.

(1) 姓名(中文): \_\_\_\_\_ (2) 姓名(英文): \*先生/女士

Name (in Chinese): \_\_\_\_\_ Name (in English): \*Mr./ Ms. \_\_\_\_\_

(3) 氣體標準事務處檔案號碼:

GasSO reference no.: GSO/GPS/52/04/ \_\_\_\_\_

以下各部份應由勝任人士所屬的註冊氣體供應公司填寫。

The following sections should be completed by the RGSC that the CP belongs to.

乙部 - 僱用詳情 SECTION B - DETAILS OF EMPLOYMENT

(4) 工作性質: Nature of Work:  司機 Driver  跟車 Attendant

(5) 僱主名稱: Name of Employer: \_\_\_\_\_

(6) 註冊氣體供應公司名稱: (若與(9)所填寫的不同)

Name of the RGSC: (If different from (9) above) \_\_\_\_\_

(7) 註冊氣體供應公司負責人姓名及職位:

Name & Post of the RGSC's Responsible Person: \_\_\_\_\_

(8) 通訊地址:

Correspondence Address: \_\_\_\_\_

(9) 聯絡電話: Contact Tel.: \_\_\_\_\_

(10) 傳真號碼 Fax No.: \_\_\_\_\_

丙部 - 訓練及經驗 SECTION C - TRAINING AND EXPERIENCE

(11) 上述人士於過去一年是否曾參予以下實際訓練或演習?

†主辦機構

Did this person attend the following practical training/drill in the past one year? Organizer

(a) 缸車緊急事故或火警演習

\* 是 / 否

註冊氣體供應公司 RGSC

Road Tanker Emergency/Fire Drill

\* Yes / No

其他 Other: \_\_\_\_\_

(b) 缸車石油氣緊急回收演習

\* 是 / 否

註冊氣體供應公司 RGSC

Road Tanker Product Recovery Drill

\* Yes / No

其他 Other: \_\_\_\_\_

(c) 使用缸車上的滅火筒

\* 是 / 否

註冊氣體供應公司 RGSC

Use of Fire Extinguisher on Road Tanker

\* Yes / No

其他 Other: \_\_\_\_\_

(d) 缸車裝卸程序實際訓練

\* 是 / 否

註冊氣體供應公司 RGSC

Practical Training on Product Loading/Unloading

\* Yes / No

其他 Other: \_\_\_\_\_

EMSD/GSO/114 (02/2004)

第1頁 Page 1 of 3

\* 把不適用者刪去 \*Delete where not applicable  
† 在適當方格加上‘✓’號 ‘✓’ as appropriate

## APPENDIX I

- (e) 防禦性駕駛訓練  
Defensive Driver Training \* 是 / 否  註冊氣體供應公司 RGSC  
\* Yes / No  其他 Other: \_\_\_\_\_
- (f) 其他 Others: \_\_\_\_\_ \* 是 / 否  註冊氣體供應公司 RGSC  
\* Yes / No  其他 Other: \_\_\_\_\_
- (g) 其他 Others: \_\_\_\_\_ \* 是 / 否  註冊氣體供應公司 RGSC  
\* Yes / No  其他 Other: \_\_\_\_\_

### 丁部 - 定期體格檢驗、藥物測試 SECTION D - REGULAR HEALTH AND FITNESS EXAMINATION & DRUG TESTS

- (12) 上述人士是否曾在過去兩年內接受體格檢驗，並獲註冊醫生證明適合受僱在缸車上工作?  
(如申報工作性質為司機，醫生須於體格檢驗報告上註明接受驗身人士在體格上是否適合駕駛  
中型或大型貨車) 上次驗身/測試的日期  
Date of Last Exam/Test
- Was health and fitness examination conducted by a registered medical practitioner during the last 2  
years certifying that the person was physically fit to work? (For drivers, the doctor shall certify,  
on the report, if he/she is medically fit to drive a medium/heavy goods vehicle) \* 是 / 否  
\* Yes / No
- (13) 上述人士是否曾在過去十二個月內接受藥物測試，並獲註冊醫生證明沒有服用下述藥物的證  
據?(包括大麻、狂喜、海洛英、冰、鴉片) \* 是 / 否  
\* Yes / No
- Were drug tests conducted during the last 12 months certifying that there was no evidence of abuse  
of the drugs specified? (Including Cannabis, Ecstasy, Heroin, Ice, Opium)
- (14) 上述勝任人士在過去十二個月是否曾接受酒精濃度測試? \* 是 / 否  
\* Yes / No
- Was the CP subject to alcoholic tests during the last 12 months?

### 戊部 - 聲明 SECTION E - DECLARATION

本人謹此聲明本表格內所載列的內容及附上的文件均真實無誤。

I hereby declare that all the particulars, statements and documents submitted in/with this form are true and correct.

(15) 勝任人士簽署

Signature of Competent Person \_\_\_\_\_

(16) 註冊氣體供應公司負責人簽署及公司蓋印

Signature of RGSC Responsible Person and Company Chop \_\_\_\_\_

(17) 日期 Date \_\_\_\_\_

### 己部 - 所需文件 SECTION F - REQUIRED DOCUMENTS

(18) 遞交申請書時，請一併附上以下文件的影印副本，並於空格內加上'✓'號以作註明:-

When you submit the application, please also submit the photocopies of the following documents and put a '✓' in the appropriate box(es).

- 完成訓練證明書或記錄 Training Attendance Certificates or Records  
 體格檢驗報告 Health and Fitness Examination Report  
 藥物測試報告 Drug Test Report  
 有效的駕駛執照 (只適用於司機) Valid Driving Licence (for drivers only)  
 過去三年的交通違例判罪及違例記分記錄 (只適用於司機)  
Traffic Conviction and Driving-offence Points Records in the past 3 years (for drivers only)



## APPENDIX I

### 注意事項 IMPORTANT NOTES

- (1) 註冊氣體供應公司須每年一次為其屬下每位受僱的勝任人士填妥及遞交此表格。藉以更新個人資料，及記錄過去一年所接受的訓練或應變演習。  
The Registered Gas Supply Company (RGSC) shall submit this form once in every year for each of its CPs for updating their personal particulars, and training or drill attended during the previous year.
- (2) 如任何已申請註冊或已註冊的勝任人士離職或不再擔任石油氣缸車司機或跟車的工作，所屬註冊氣體供應公司須於十四日內以書面將此事通知當局。  
If any CP ceases to be employed as an LPG road tanker driver/attendant, the RGSC shall inform the Authority of such fact in writing within 14 days thereafter.
- (3) 註冊氣體供應公司須為每位受僱的勝任人士安排最少每兩年一次的體格檢驗，及最少每年一次的藥物測試。此外，註冊氣體供應公司亦須根據當局發出的指引，為勝任人士進行酒精濃度測試。  
The RGSC shall arrange health and fitness examination once in every 2 years, and drug tests once in every year for each of its CPs as a minimum requirement. In addition, the RGSC shall conduct the required alcoholic tests for the CPs in accordance with the guidelines issued by the Authority.

### 遞交申請方法 SUBMISSION OF APPLICATION

- (1) 申請表格可送交或郵寄「香港銅鑼灣加路連山道98號616室機電工程署氣體標準事務處氣體安全監督」。申請表格如為影印本或以傳真方式遞交，概不受理。  
This application form shall be submitted, by hand or mail, to 'The Gas Authority, Gas Standards Office, Room 616, Electrical & Mechanical Services Department, 98 Caroline Hill Road, Causeway Bay, Hong Kong'. Photocopy or facsimile of this form will not be accepted.
- (2) 申請可經由電子方式提交，詳情請瀏覽：「<http://www.info.gov.hk/emsd/submission>」  
Application may be submitted electronically. For details, please refer to: 「<http://www.info.gov.hk/emsd/submission>」
- (3) 如有疑問，請向香港銅鑼灣加路連山道98號機電工程署氣體標準事務處查詢（電話號碼：2808 3683）。  
Enquiries can be directed to the Gas Standards Office, EMSD, 98 Caroline Hill Road, Causeway Bay, Hong Kong (Tel. 2808 3683).

### 個人資料的說明 NOTES ABOUT PERSONAL DATA

- (1) 本申請表格所收集的個人資料，政府會用於以下用途：  
The personal data collected by means of this form will be used by the Government for the following purposes:
  - (a) 評估你的資歷，以確定你是否合資格加入所申請的勝任人士名單內；及  
to assess your qualifications in order to determine your eligibility for inclusion in the List of Competent Persons for each class you apply for; and
  - (b) 方便政府日後和你通訊。  
to facilitate future communication between the Government and you.

如你未有提供足夠資料，本署將無法處理你的申請。你的個人資料將存於機電工程署，並會向本署的資料使用者披露。公眾可查閱你的名字及聯絡資料。根據個人資料（私隱）條例第18及第22條，以及附表1第6原則的規定，你有權查閱及改正個人資料。你的查閱權利包括索取本申請表格上所載個人資料的副本。若有任何關於本表格所收集個人資料的查詢，包括要求查閱及改正資料，請向氣體安全監督提出。

If you do not provide sufficient information, we may not be able to process your application. Your personal data will be kept at the Electrical and Mechanical Services Department and be disclosed to the data users of the Department. Your name and contact details may be disclosed to the public for their information. You have a right of access and correction with respect to personal data as provided for in sections 18 and 22 and Principle 6 of Schedule 1 of the Personal Data (Privacy) Ordinance. Your right of access includes the right to obtain a copy of your personal data provided by this application form. Enquiries concerning the personal data collected by means of this application form, including the making of access and corrections, should be addressed to the Gas Authority.