Guidance Note on Liquefied Petroleum Gas Storage Installations

Gas Safety (Gas Supply) Regulations
Cap 51 Sub Legislation B
(Regulations 1 to 14)

The Gas Authority
The Government of the Hong Kong Special Administrative Region

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Foreword

This Guidance Note is prepared to provide a practical guidance on how to comply with the requirements of LPG Storage Installation in accordance with the Gas Safety (Gas Supply) Regulations 1 to 14 of Cap.51B.

Owners/users must ensure compliance with all other relevant safety standards and with other local statutory requirements imposed by the government.

Introduction

1. The guidance note contained in this document gives practical guidance on how to comply with the Gas Safety (Gas Supply) Regulations 1 to 14 of, Cap. 51B. It has been drawn up in consultation with the owners, gas supply companies, professional bodies, competent persons and government departments.

2. LPG referred to in this document means any gas which is a mixture of -

   (a) hydrocarbons primarily consisting of butanes, butylenes, propane or propylene; or

   (b) all or any of the hydrocarbons referred to in paragraph (a).

3. LPG storage installations referred to in this document are those defined in Regulation 2 of the Gas Safety (Gas Supply) Regulations, Cap.51B.

4. Containers referred to in this document are those defined in Section 2 of the Gas Safety Ordinance, Cap. 51 which include:

   (a) tanks;

   (b) mini-tanks; and

   (c) cylinders.

5. Competent person referred to in this document means a person who is competent by virtue of his training and substantial practical experience to carry out the task. Persons who meet the criteria stipulated in the Code of Practice for Hong Kong LPG Industry, Module 1 will be acceptable by the Gas Authority as a competent person.

6. References quoted in this document do not imply approval by the Gas Authority of that document. A list of these references is given in Appendix 1.

7. The practical advice given in this document is written in general terms; it should be used in conjunction with the more detailed advice in the referenced publications in Appendix 1.

Guidance Note

PART I – PRELIMINARY

Regulation 1 – Citation

These regulations may be cited as the Gas Safety (Gas Supply) Regulations.

Regulation 2 – Interpretation

(1) In these regulations, unless the context otherwise requires

"approved plans" (批准圖則), in relation to construction work which has construction approval, means the plans, including any modifications thereto, specified in a notice under regulation 5(1)(a) or (b) as the plans in accordance with which the construction work shall be carried out;

"cargo compartment" (載貨間), in relation to a cylinder wagon, means that part of the wagon which is used to carry cylinders;

"construction approval" (建造批准) means the approval under regulation 5(1)(a) or (b) of construction work;

"construction work" (建造工程) means work in connection with the erection, relocation or major alteration of a notifiable gas installation, or major repairs of a structural nature to a notifiable gas installation;

GN	1. The work required for exposing buried tanks, pipes or other equipment for testing and/or examination, maintenance works, replacement work, or the reinstatement afterwards are not considered as “construction work”. 2. The work required for extending the outlet pipework of an LPG installation for supplying gas to an additional building is considered as a major alteration of the LPG storage installation and hence the work falls into the meaning of “construction work”.

"direct-fired vaporiser" (明火直熱式汽化器) means a vaporiser which burns liquefied petroleum gas or other fuel to provide heat directly to that part of the vaporiser through which liquefied petroleum gas flows;

"equipment" (設備), in relation to a gas vehicle, includes fittings and accessories;

"fill" (注入), in relation to a container, includes refill;

"fixed maximum level device" (固定式最高液位計) means a device fitted to 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;

"flexible gas tubing" (氣體接駁軟喉) means flexible gas tubing within the meaning of the Gas Safety (Miscellaneous) Regulations (Cap 51 sub. leg. F);

"high pressure" (高壓) means a pressure of more than 700 kPa;

"intermediate pressure" (次高壓) means a pressure of more than 240 kPa but not more than 700 kPa;

"label" (標籤) means a label issued under regulation 34;

"liquefied petroleum gas storage installation" (石油氣儲存裝置) means a gas installation as described in paragraph (f) of the definition of "notifiable gas installation" (應具報氣體裝置);

GN	3. The buildings or structures of the store room, vaporiser room or the compound boundary walls etc. are not considered as a part of a "Liquefied petroleum gas storage installation". These are safety features for protecting the key components of an LPG storage installation, for preventing it from being tampered, and for maintaining adequate separation distances e.g. between the hazardous zone of the installation and sources of ignition.

"low pressure" (低壓) means a pressure of not more than 7.5 kPa;

"medium pressure" (中壓) means a pressure of more than 7.5 kPa but not more than 240 kPa;

"permit" (許可證) means a permit issued under regulation 26 in respect of a gas vehicle;

"prescribed fee" (訂明費用), in relation to any provision of these regulations means the fee prescribed in Schedule 1 in relation to that provision;

"use" (使用), in relation to a motor vehicle, includes drive;

"vaporiser" (汽化器) means any equipment used, or to be used, to provide heat for the vaporisation of liquefied petroleum gas.

(2) In these regulations, unless the contrary intention appears, a reference to –

(a) the erection of a notifiable gas installation includes, where the case requires, a reference to the removal of the installation and its re-erection, with or without alteration, after its removal from another location;

(b) the alteration of a notifiable gas installation includes a reference to

(i) the demolition of part of the installation; and

(ii) an addition to the installation; and

GN	4. For the purpose of Regulation 2(2)(b)(i) of Cap. 51B, the complete demolition or complete decommissioning of an LPG storage installation is not considered as an alteration of the installation. 5. For the purpose of Regulation 2(2)(b)(ii) of Cap. 51B, a pipeline extension project is considered to be an addition to a

	LPG storage installation.

(c) carrying out construction work in accordance with approved plans includes a reference to the carrying out of construction work in accordance with plans, or those plans as amended, whether before or after the commencement of the construction work, as approved in accordance with these regulations.

PART II – CONSTRUCTION AND USE OF NOTIFIABLE GAS INSTALLATIONS

Regulation 3 – No person to construct, etc. notifiable gas installation unless construction approval, etc. has been obtained

(1) No person shall-

(a) carry out any construction work unless such work has construction approval; or

(b) use any notifiable gas installation to which any construction approval relates unless the use of such installation is approved under regulation 6.

GN	6. Construction approval, stipulated under Regulation 3(1)(a) of Cap.51B, is granted by the Gas Authority to a person to carry out construction work in connection with a notifiable gas installation. 7. The Gas Authority will grant approval of use of a notifiable gas installation, stipulated under Regulation 6 of Cap.51B, to the same person who has obtained construction approval of construction work in connection with the notifiable gas installation.

(2) No person shall supply gas to a notifiable gas installation where he knows, or ought reasonably to know, that –

(a) construction work has been carried out on it; or

(b) it is being used,

in contravention of subregulation (1).

(3) For the avoidance of doubt, it is hereby declared that the erection of a notifiable gas installation which is a store includes placing any container or containers in the place which is or is to be the store, and whether or not –

(a) the container or containers, as the case may be, are-

(i) placed in any premises or part of any premises;

(ii) owned by one or more persons;

(b) any other construction work has been carried out in relation to the store.

(4) For the avoidance of doubt, it is hereby declared that the definition of "container" in section 2 of the Ordinance shall apply for the purposes of subregulation (3).

Regulation 4 – Application for construction approval

(1) The person who proposes to carry out construction work may make an application to the Authority for construction approval of the construction work, including modifications of construction work for which construction approval has already been given.

(2) An application under subregulation (1) shall be –

(a) in the approved form; and

GN	8. If during the construction stage the applicant encounters problem that the construction work could not be carried out in accordance with the approved plans or conditions of construction approval, the applicant should make further application for modification of the approved plans and conditions of construction approval in accordance with Regulation 4(1) of Cap.51B, unless such modification is not a major alteration.

(b) accompanied by –

(i) a written statement as to the purpose of the notifiable gas installation to which the application relates;

(ii) the prescribed fee;

(iii) 2 copies of all plans relating to the installation, including-

(A) a plan showing the siting of the installation; and

(B) a plan showing details of the environment surrounding the installation; and

(iv) a written statement setting out particulars of all buildings, containers, machinery, plant and equipment to form part of, or to be used in connection with, the installation.

(3) The Authority may, by notice in writing served on a person who has made an application under subregulation (1), require the person to furnish him with –

(a) 2 copies of all such plans as are specified in the notice, being plans in addition to those specified under subregulation (2)(b)(iii); or

(b) such particulars as are specified in the notice,

being plans and particulars which the Authority thinks necessary for determining the application under regulation 5.

Regulation 5 – Determination of application of construction approval

(1) Subject to this regulation, the Authority shall determine an application made under regulation 4(1) by a person for construction approval by serving in accordance with subregulation (2) a notice on the person –

(a) granting construction approval of the construction work in accordance with such plans as were submitted under regulation 4(2)(b)(iii) with that application, and such other plans as were submitted in accordance with any notice under regulation 4(3) served on that person;

(b) granting construction approval of the construction work in accordance with such plans as were submitted under regulation 4(2)(b)(iii) with that application, and such other plans as were submitted in accordance with any notice under regulation 4(3) served on that person, subject to such reasonable conditions by way of modifications to any of those plans as are set out in the notice served under this regulation on that person; or

(c) refusing to grant construction approval of the construction work.

(2) A notice under subregulation (1) in respect of an application made under regulation 4(1) shall be served –

(a) where no notice has been given under regulation 4(3) in respect of that application within a period of 60 days after that application was so made, not later than the expiration of that period; and

(b) where a notice has been given under regulation 4(3) in respect of that application within a period of 60 days after that application was so made, not later than 30 days after the Authority has been furnished with the plans or particulars required by the notice under regulation 4(3).

GN	9. The Gas Authority may grant Construction Approval to the construction work in accordance with Regulation 5(1)(a) of Cap.51B or Regulation 5(2)(b) of Cap.51B, if the applicant demonstrates that the design, material and construction standards of the proposed construction works comply with the following codes of practice and guidelines – (a) Code of Practice for Hong Kong LPG Industry, Module

	1 – "LPG Compounds and Cylinder Stores" (b) Code of Practice for Hong Kong LPG Industry, Module 2 – "Underground LPG Pipework" (c) Code of Practice for Liquefied Petroleum Gas Filling Stations in Hong Kong (d) Guideline for LPG Vehicle Fuel System Maintenance Workshop (e) Guidance Note on – Storage of Disposable LPG Cylinders in Stores Other Than Retail Outlets

(3) The Authority shall not grant construction approval of construction work unless –

(a) the notifiable gas installation will, if constructed in accordance with the approved plans, comply with the requirements under the Ordinance applicable to such an installation; and

(b) the Authority is satisfied that the notifiable gas installation will not present an unacceptable risk to the health and safety of members of the public residing or working in the vicinity of the place where the installation will be constructed, whether during its construction or after it is brought into use.

GN	10. For LPG storages in bulk, the applicant should submit a report of quantitative risk assessment to the Gas Authority to demonstrate that the proposed notifiable gas installation will not present an unacceptable risk to the health and safety of members of the public as stipulated in the Regulation 5(3)(b) of Cap.51B. The quantitative risk assessment should estimate the risk arising from the LPG storage installation taking into consideration of the estimated population in the future based on the information available from the Planning Department. The individual risk and societal risk of the proposed notifiable gas installation, during both construction and operation stages, should not exceed the thresholds of the Hong Kong Planning Standards and Guidelines.

(4) Without prejudice to the generality of conditions which may be imposed under subregulation (1)(b) by way of modification to any plans submitted under regulation 4(2)(b)(iii) or submitted in accordance with a notice served under regulation 4(3), construction approval of construction work may be granted subject to such reasonable conditions, whether by way of modification to such plans or otherwise –

(a) as the Authority thinks fit, in particular –

(i) specifying the construction and location of buildings or other

structures on the site which is served or to be served by the notifiable gas installation for the purpose of ensuring that ventilation of the installation will not be impaired; and

(ii) restricting the planting of vegetation in the vicinity of the notifiable gas installation for the purpose of ensuring that ventilation of the installation will not be impaired or that a potential fire hazard for the installation is not created; and

(b) as are specified in the notice under subregulation (1) of such construction approval.

(5) Where the Authority grants construction approval of construction work, he shall endorse every page of the approved plans in respect of the notifiable gas installation and –

(a) retain one set of copies of such plans; and

(b) forward one set of copies of such plans with the notice under subregulation (1) of such construction approval.

(6) Where the Authority –

(a) grants construction approval of construction work subject to conditions; or

(b) refuses to grant construction approval of construction work,

he shall specify in the notice under subregulation (1) of such grant or refusal of construction approval, as the case may be, his reasons for the imposition of the conditions or the refusal, as the case may be.

Regulation 6 – Approval of use of notifiable gas installation

(1) Where a person who has been granted construction approval of construction work is of the opinion that the construction work has been completed in accordance with that construction approval, he may, by notice served on the Authority and accompanied by the prescribed fee –

(a) state that he is of that opinion; and

(b) request the Authority to approve the use of the notifiable gas installation concerned.

GN	11. The Gas Authority will consider a construction work is completed in accordance with Regulation 6(1) of Cap.51B if all the construction work as detailed in the construction approval, except for the case of an addition to an existing system where the final work required for connecting the addition to the existing system may be carried out after obtaining the approval of the use of installation, is completed. 12. The testing and certification of containers, vaporisers, pipework and other critical equipment to ascertain that they

	are fit for safe use, are part of the construction work which should have been completed before serving a notice to the Gas Authority for requesting for the approval of use, in accordance with Regulation 6(1) of Cap.51B, of the newly erected or altered LPG storage installation.

(2) Where the Authority is served a notice under subregulation (1) by a person he shall, not later than 14 working days after such service –

(a) inspect the notifiable gas installation concerned; and

(b) if, after such inspection-

(i) he is of the same opinion as that stated in that notice, by notice served on that person approve the use of that installation subject to such conditions, if any, as he thinks fit; and

(ii) he is not of that opinion, by notice served on that person refuse to approve the use of that installation.

GN	13. According to Regulation 6(2)(b)(ii) above,the Gas Authority will refuse to approve the use of the notifiable gas installation concerned if at the time of inspection the work was considered incomplete or if one or more of the conditions of construction approval are not complied with. Upon rejecting an application for the approval of use of the notifiable gas installation in accordance with Regulation 6(2)(b)(ii) of Cap.51B, the Gas Authority will re-inspect the whole notifiable gas installation in particular the outstanding work after being served another notice notifying that the construction work has been completed in accordance with the construction approval and upon receipt of the prescribed fee.

(3) Where the Authority –

(a) approves the use of a notifiable gas installation subject to conditions; or

(b) refuses to approve the use of a notifiable gas installation,

he shall specify in the notice under subregulation (2) of such approval, or refusal to approve, the use of the notifiable gas installation, his reasons for the imposition of the conditions or the refusal, as the case may be.

PART IIA – SAFETY AND INSPECTION OF NOTIFIABLE GAS INSTALLATIONS

Regulation 6A – Application

This Part applies to a notifiable gas installation whether or not it was constructed before, on or after the commencement of this Part.

Regulation 6B – General duty of owner of notifiable gas installation to maintain, etc. installation in safe condition

Without prejudice to the operation of any other provisions of these regulations in relation to a notifiable gas installation (howsoever described), the owner of the installation shall maintain and operate the installation in a safe condition for the prevention of fire, explosion or other danger arising from the installation.

GN	14. For the purpose of Regulation 6B of Cap.51B on prevention of fire, explosion or other dangers, the owner should implement measures, where applicable, on the prevention of excessive storage of LPG, the prevention of mixed storage of LPG with other combustible materials, the prevention of gas leak, the prevention of LPG from entering drain openings, the prevention of blockage of escape path, the prevention of ignition of LPG through a combination of measures including the detection of gas leak, the giving out of alarm signal, the prevention of source of ignition, and the provision of fire fighting facilities, etc., and the provision of adequate cooling to containers for the prevention of boiling liquid expanding vapour explosion (BLEVE), etc. 15. For the purpose of Regulation 6B of Cap.51B on prevention of other danger, the owner should implement measures on the prevention of cold burns of skin from liquid LPG and the prevention of suffocation from inhalation of LPG.

GN	16. For the requirement on the owner of a notifiable gas installation to maintain and operate the installation in a safe condition for the prevention of fire, explosion or other danger arising from the installation stipulated under Regulation 6B of Cap.51B, the owner should establish and implement plan/system as detailed below: (a) The owner or his authorized person should establish and implement adequate maintenance and operation plans which are commensurate with the condition of the installation with due regards to the design, materials, construction, operation of the installation and the environment surrounding the installation. (b) Maintenance plans should include periodic checking of

	the condition of the installation such that any degradation of condition of the installation could be effectively identified for ensuring that remedial actions could be carried out to restore the condition before developing into an unsafe condition. (c) The owner should implement a safe system of work which should include a permit to work system, for any maintenance work or hot work to be carried out within the store boundary or any hazardous zone associated with the LPG storage installation (e.g. within 4.5m of the vent pipe discharge of a pressure relief valve). (d) Operation plans should include plans for routine operations which should ensure that only suitably trained personnel are permitted to operate the installation and that the relevant operational limits will not be exceeded. (e) Operational plans should also include plans for handling emergency situations. If applicable, reference should be made to the relevant sections of the voluntary code of practice: Code of Practice for Hong Kong LPG Industry, Module 7 – "Operating Procedures for Emergencies for LPG Compounds and Cylinder Stores".

Regulation 6C – Inspections to be carried out by owner of notifiable gas installation

(1) The Authority may, by notice in the Gazette, specify –

(a) the inspections which the owner of a notifiable gas installation specified in the notice, or belonging to a class of notifiable gas installations specified in the notice, shall carry out on the installation to ascertain whether the installation is maintained and operated in accordance with regulation 6B;

(b) the intervals at which, or the circumstances in which, such inspections shall be carried out;

(c) the written records which shall be kept of such inspections by such owners and the periods for which any such records shall be retained by such owners;

(d) the copies of any such records to be submitted to the Authority by such owners and the periods within which any such records are to be so submitted after they have been made.

GN	17. For the purpose of Regulation 6C(1) of Cap.51B, the Gas Authority has specified by Gazette Notice 5722 the requirements related to periodic inspection on LPG storage

	installations. (Please refer to Appendix 2.)

(2) The owner of a notifiable gas installation shall –

(a) comply with the requirements of any notice under subregulation (1) applicable to him;

(b) if required to carry out any inspection specified in the notice, ensure that the inspection is carried out by –

(i) a person who is competent, by virtue of his training and substantial practical experience, to carry out that inspection; or

(ii) a person who is under the supervision of a person referred to in subparagraph (i).

GN	18. For the purpose of Regulation 6C(2)(b)(i) of Cap.51B, the Gas Authority will accept the circumstances below: (a) The competent person carrying out the inspection may not have full expertise on building works or structural safety. He / she will have discharged his / her duties as long as a visual inspection is made of the structures / buildings to see if there are obvious defects that may jeopardize the safety of the LPG equipment. It will be the owner's responsibility to engage the services of other professional (e.g. Authorized Person / Registered Structural Engineer / Registered Geotechnical Engineer who are registered under the Buildings Ordinance, Cap. 123) when necessary for checking the integrity of the structures. (b) For existing compounds where provision of LPG trap has not been made due to site constraints or the LPG trap is merely a submerged pipe outlet inside a catch pit, the competent person shall check at the annual inspection to ensure that provisions have been made to prevent any LPG releases from entering the public drains.

GN	19. To fulfil the Regulation 6C(2)(b)(i) of Cap.51B, the owner of a notifiable gas installation should require the competent person to complete the inspection covering all items specified in the Gazette Notice 5722. In particular, the owner should instruct the competent person to: (a) The competent person should prepare a report, using the Form 109 or Form 109A, on the results upon the completion of inspection. The competent person should be required to state his opinion as to whether he considers that the installation, at the time of inspection, was maintained and operated in accordance with Regulation 6B of Cap.51B. Form 109 and Form 109A, which may be used for reporting purpose, are available for download at EMSD website. (b) During the annual inspection, the competent person should check the fire services installation (FSI) requirements against the latest construction approval plans, similar approved plans or the requirements specified in the Code of Practice for Hong Kong LPG Industry, Module 1 "LPG Compounds and Cylinder Stores" and verify that the FSI including fire extinguishers are physically maintained at the installation and have valid F.S. 251 certificates. Fire extinguishers should have the validity dates identifiable on the body. The owner should be responsible for the up keeping of the FSI at location, for arranging scheduled maintenance and testing by FSI contractors, and for providing copies of F.S. 251 certificates to the competent person. (c) During the annual inspection, the competent person should check that the electrical apparatus has been maintained in accordance with the relevant area classification and that no new electrical apparatus of an inappropriate class has been installed within any of the hazardous areas. (d) The competent person should check the Periodic Test Certificate (Form WR2) of the fixed electrical installations of the notifiable gas installation when carrying out the annual inspection.

PART III – REQUIREMENTS FOR CONTAINERS

Regulation 7 – Only approved containers may be used to contain liquefied petroleum gas

(1) Subject to subregulation (2), the owner of a container shall not use the container to contain liquefied petroleum gas unless the container –

(a) has been approved in writing, or is of a type which has been approved in writing, by the Authority for such use; or

GN	20. For the purpose of Regulation 7(1)(a) of Cap.51B, the following documents should be provided together with the application to the Gas Authority for approval of the LPG tanks: (a) Mill certificates and material traceability records; (b) Manufacturer's certificate of compliance issued by independent party; (c) Hydrostatic test report; (d) 100% radiography weld test report; (e) Magnetic particle/ultrasonic weld test report; (f) Charpy impact test report at minimum design temperature; (g) Stress relief report or post-weld heat treatment report; (h) Welding specification and welders' certificates; (i) Dimensional and tolerance records; (j) On-site testing and commissioning records; (k) Protective coating thickness report and certificate of compatibility of protective coating with cathodic protection system; (l) Holiday test report.

(b) is of a type which has been approved under regulation 64 of the Dangerous Goods (General) Regulations (Cap 295 sub. leg. B) for such use and such approval was in force immediately before the commencement of the Ordinance.

GN	21. The Gas Authority may approve the container pursuant to Regulation 7(1)(a) of Cap.51B if the container comply with the design, material and construction standards of the following voluntary codes of practice and guidelines – (a) Code of Practice for Hong Kong LPG Industry, Module 1 – "LPG Compounds and Cylinder Stores" (b) Code of Practice for Hong Kong LPG Industry, Module 9 – "LPG Cylinders" (c) Code of Practice for Liquefied Petroleum Gas Filling Stations in Hong Kong

	(d) Guidance Note GU18 – "Safety of LPG Lighters" (e) Guidance Note GU19 – "Safety of Disposable LPG Cylinders"

(2)Where the Authority is satisfied that a container to which subregulation (1)(a) or (b) applies –

(a) has shown to be prejudicial to the safety of the members of the public; or

(b) has, for any other reason (including its supersession by another type of container), ceased to be of a standard of safety acceptable to the Authority,

then the Authority may, by notice in the Gazette, specify a date on and after which the owner of the container shall cease to use the container to contain liquefied petroleum gas.

(3) No person shall, without reasonable excuse, use a container the subject of a notice under subregulation (2) to contain liquefied petroleum gas on or after the date specified in the notice as the date on which such use of the container shall cease.

Regulation 8 – Examinations and inspections to be carried out on cylinders and tanks

(1) No person shall fill any cylinder with liquefied petroleum gas unless –

(a) the cylinder has, immediately prior to such filling, been externally examined for defects, including dents, gouges and corrosion; and

(b) the person who has carried out such examination is of the opinion that it is safe for that cylinder to be so filled.

GN	22. To fulfil the requirement of Regulation 8(1) of Cap.51B, before a cylinder is allowed to be filled, the cylinder should have been examined by a person who has been trained to carry out external visual examination of cylinders in accordance with the recommendations of the relevant design specification of the cylinder to ascertain that it is safe for such cylinder to be so filled. 23. For the purpose of Regulation 8(1)(b) of Cap.51B, a cylinder is considered to be not safe to be filled under the following conditions: (a) Cylinders which are disposable cylinders and have been filled once should not be refilled. (b) Cylinders with defects, including dents, gouges and corrosion, the person who carries out such examination should not permit the cylinder to be so filled unless he has been trained to assess the defects in accordance with the relevant recommendations of

	the cylinder specification and that his opinion is that the cylinder is still safe. (c) Cylinders with valves that have an external O-ring should not be filled if the O-ring is broken, cracked or missing. The O-ring should be replaced before re-filling is permitted. (d) Cylinders with pressure relief valves damaged or blocked should not be filled. (e) Cylinders which have been overdue for the periodic test and examination as required under Regulation 8(2) should not be filled.

(2) The owner of a cylinder (other than a disposable cylinder) shall not use the cylinder to contain liquefied petroleum gas unless the cylinder has been tested and examined not less than once in the 5 years period immediately preceding such use to ascertain whether the cylinder is safe to be so used.

GN	24. In order to fulfil the Regulation 8(2) of Cap.51B, the owner of a cylinder should implement the following measures: (a) Cylinders, other than vehicle fuel tanks, the owner should implement a monitoring system to ensure that all cylinders in the circulation will be periodically tested and examined as required under this sub-regulation. (b) The owner of a cylinder should only permit the cylinder to be filled or refilled with LPG after he has ascertained that the cylinder is safe for use to contain LPG through the results of test and examination in accordance with the relevant cylinder specification and that the test and examination were conducted within a 5 year period immediate preceding such filling. 25. The guidance notes for the test and examination stipulated under Regulation 8(2) of Cap.51B are as follows: (a) The scope of the test and examination of a cylinder should include the test and examination of the cylinder shell and support etc. in accordance with the relevant requirements of the cylinder design specification. After re-assembled all critical components, the cylinder and its components should be subjected to functional tests and a leak test. (b) All cylinders should be visually inspected. For a cylinder with defects including dents, gouges and

corrosion, the defects should be assessed against the guidelines which are set out in the design specification to ascertain whether the cylinder is safe for further use to contain LPG.

(c) Some cylinder specifications require conducting a proof test or volumetric expansion test. Water should be used as the testing medium for such tests. The test pressure and duration should follow the requirements of the cylinder design specification.

(d) All pressure gauges used for proof test or volumetric expansion test should be of adequate precision and accuracy, and calibrated regularly with records, in accordance with the relevant design specification of the cylinders under testing and examination.

(e) During proof test, cylinders should be examined under test pressure and show no sign of distortion. The test pressure should be maintained for the specified duration as required by the cylinder design specification. Cylinders which failed the test should be classified as condemned cylinders and be clearly identified to prevent them from being filled with LPG.

(f) For cylinders, the test and examination should be either conducted by a competent person or by an inspection body which has been accredited by a national certification body to ISO 17020 or equivalent for carrying out such test and examination, or by suitably trained personnel of the gas supply company who owns the cylinders.

(g) A cylinder is considered as having been ascertained as safe for use to contain LPG if the competent person, the inspection body or suitably trained personnel of the gas supply company, who conducted the test and examination has, based on the results of the test and examination, certified that the cylinder is safe for such use.

(h) If various tests are carried out in different dates to a cylinder during the process of periodic test and examination, the date of the proof test or volumetric expansion test should be regarded as the test date of the cylinder on which the date of next test and examination is based.

(i) If the design specification requires a cylinder to be tested and examined at a frequency which is different from once every five years, the more frequent requirements should be followed.

	(j) Some design specifications limit the maximum serviceable life of the cylinders. Cylinders beyond the maximum serviceable life should not be used to contain LPG.

(3) The owner of a tank which is-

(a) above ground level; and

(b) not covered by sand or earth,

shall not use the tank to contain liquefied petroleum gas unless the tank has been tested and examined not less than once in the 10 years period immediately preceding such use to ascertain whether the tank is safe to be so used.

(4) The owner of a tank which is-

(a) below ground level; or

(b) above ground level and covered with sand or earth,

shall not use the tank to contain liquefied petroleum gas unless the tank has been tested and examined not less than once-

(i) in the 10 years period immediately following the first time the tank is so used; and

(ii) after the expiration of the period referred to in paragraph (i), in the 5 years period immediately preceding such use,

to ascertain whether the tank is safe to be so used.

GN	26. The guidance notes for the test and examination required under Regulation 8(3) and Regulation 8(4) of Cap.51B are as follows: (a) The owner of a tank should ensure that the tank will be purged out of service before it is due for the periodic test and examination as required under Regulations 8(3) and 8(4). (b) The owner of a tank should only permit the tank to be filled or refilled with LPG after he has ascertained that the tank is safe for use to contain LPG through the results of test and examination in accordance with the relevant vessel design and/or inspection code and that the test and examination were conducted within the period as stipulated under Regulations 8(3) and 8(4). (c) The scope of the test and examination of a tank should include the test and examination of the tank shell and support etc. in accordance with the relevant requirements of the pressure vessel design code or inspection code. (d) Pressure relief valves should be replaced at intervals

not exceeding 5 years with new ones manufactured within the preceding 24 months.

(e) All critical components of a tank should be dismantled and tested and examined for soundness in accordance with their respective design specifications or manufacturer recommendations. After re-assembled all critical components, the tank and its components should be subjected to functional tests and a leak test.

(f) For an aboveground tank, the tank should be tested and examined to relevant national or international standards and should include:

(i) an external visual inspection;
(ii) an internal visual inspection (except for tank without manhole);
(iii) a hydrostatic test;
(iv) an ultrasonic thickness test; and
(v) a magnetic particle test.

(g) For an underground or mounded tank, the tank should be tested and examined to relevant national or international standards and should include:

(i) external visual inspections;
(ii) an internal visual inspection;
(iii) a hydrostatic test;
(iv) an ultrasonic thickness test;
(v) a magnetic particle test;
(vi) a paint thickness test; and
(vii) a holiday test.

(h) Unless otherwise specified in the relevant pressure vessel design or inspection code, the following test and examination requirements should be met:

(i) <u>External Visual Inspection</u>

Aboveground tanks should be subject to a visual external examination by a competent person. Attention should be given to signs of defects including pitting, gouges and corrosion in the tank shell, supports and in particular the welded joints. For aboveground tanks with fireproof coating, the fireproof coating should also be subject to external visual inspection by qualified personnel.

Underground or mounded tanks should be subject to external visual inspections by a competent person when the tank is freshly excavated from the chamber, after the stripping of paint for magnetic particle tests and re-painting, and just before burial into tank chamber. Attention should be given to

signs of defects including pitting, gouges and corrosion in the tank shell, supports and in particular the welded joints.

(ii) Internal Visual Inspection

Aboveground tanks with a manhole and all underground or mounded tanks should be subject to an internal visual inspection by a competent person to ascertain the internal surface condition, and to ensure that the tank interior is free from loose rust and scales. Before the final closing of the manhole, a final internal visual inspection is required to ensure that the tank interior is free from water or debris.

(iii) Hydrostatic Test

Hydrostatically test of tanks should be witnessed and certified by a competent person at 1.5 times of their design pressure or at a test pressure specified in relevant pressure vessel design or inspection codes for integrity. Water should be used as the test medium for hydrostatic testing. The test pressure and duration should follow the requirements of the relevant pressure vessel design or inspection code. All pressure gauges used for hydrostatic test should be of adequate precision and accuracy. During hydrostatic test, the tank should be examined under test pressure, as far as practicable, to ascertain that it shows no sign of crack or distortion.

(iv) Ultrasound Thickness Test

Tanks should have the shell thickness measured at enough spots over its surface by qualified personnel so as to establish a representative view of the thickness for the entire tank. The thickness gauge used should be of adequate precision and accuracy, and appropriately calibrated. Measured shell thickness should be compared against, by a competent person, the calculated minimum thickness for determining whether the tank is safe for further use to contain LPG. If local thinning occurs, fitness for further service should be ascertained using standards (e.g. AS 3788 appendix N, or API-579) which are relevant to the original design code of the tank. For thinning or pitting defects, the competent person should examine the surface condition in particular in areas where water may be accumulated such as the gap between the flanges to check whether they can be safely used. Rectification should be taken at

proper time if the thinning or pitting defects will worsen to beyond acceptable limits before the next test and examination. The competent person may shorten the interval of the next test and examination if he thinks proper and should notify the owner and the Gas Authority in his report for their attention.

(v) Magnetic Particle Test
Tanks should have all weld seams at pressure containing parts magnetic particle tested by qualified personnel on the outside to ensure that all welds are free from cracks.

(vi) Paint Thickness Test
The thickness of the protective coating over the entire external surface of tanks should be measured by qualified personnel to verify that the thickness of the coating is sufficient (e.g. 400µm minimum for epoxy coating) for protecting the tank from corrosion. The paint thickness gauge used should be of adequate precision and accuracy, and appropriately calibrated. Any defects found should be repaired and retested before burying the tank.

(vii) Holiday Test
The protective coating over the entire external surface of tanks should be subject to a holiday test by qualified personnel to detect unacceptable discontinuities such as pinholes and voids. Any defects found should be repaired and retested before burying the tank.

(i) A tank is considered as having been ascertained as safe for use to contain LPG if, on the basis of the results of the required test and examination, it is certified by a competent person or by an inspection body which has been accredited by a national certification body to ISO17020 for carrying out such test and examination.

(j) If various tests are carried out in different dates to a tank and related parts during the process of periodic test and examination, the date of the certification by Competent Person should be regarded as the test date of the tank on which the date of next test and examination is based.

(k) Some pressure vessel design codes limit the maximum serviceable life of the tank. Tanks beyond the maximum serviceable life should not be used to contain

	LPG.

(5) The owner of a tank shall keep a written record of the results of any test and examination carried out on the tank pursuant to subregulation (3) or (4) until the tank ceases to be used to contain liquefied petroleum gas.

(6) Where any test and examination carried out on a tank pursuant to subregulation (3) or (4) shows that the tank is not safe to be used to contain liquefied petroleum gas, the owner of that tank shall not so use the tank unless work has been subsequently carried out on the tank which renders the tank safe to be so used.

GN	27. For the purpose of Regulation 8(6) of Cap.51B, the owner of a tank should not use a tank to contain LPG if the competent person or inspection body refuses to certify the tank as safe for use to contain LPG.

(7)Any test and examination carried out before the commencement of the Ordinance on –

(a) a cylinder, in accordance with regulation 66 of the Dangerous Goods (General) Regulations (Cap 295 sub. leg. B), shall be deemed to be a test and examination carried out on that cylinder in accordance with subregulation (2); and

(b) a tank, in accordance with the terms and conditions endorsed on a licence to store liquefied petroleum gas in that tank granted under the Dangerous Goods Ordinance (Cap 295), shall be deemed to be a test and examination carried out on that tank in accordance with subregulation (3) or (4), as the case may be.

Regulation 9 – Pressure relief valves fitted to cylinders

The owner of a cylinder which has a water capacity of-

(a) not less than 40 litres, shall not use the cylinder to contain liquefied petroleum gas unless the cylinder is fitted with a pressure relief valve-

(i) of the spring-loaded, or equivalent, type; and

(ii) in contact with the vapour space of the cylinder when it is positioned for normal use;

(b) less than 40 litres, shall not, subject to paragraph (c), use the cylinder to contain liquefied petroleum gas if the cylinder is fitted with a pressure relief valve unless the cylinder has-

(i) been used to contain such gas before the commencement of the Ordinance; and

(ii) not been re-valved on or after that commencement; and

(c) less than 40 litres, shall not use the cylinder to provide-

(i) liquefied petroleum gas to a dim sum trolley; or

(ii) such gas in liquid form,

unless the cylinder is fitted with a pressure relief valve.

GN	28. The owner of a cylinder should ensure that the full flow capacity of the pressure relief valve, required under Regulation 9(a) and 9(c) of Cap.51B, is adequate to protect the cylinder from excessive pressure in accordance with relevant design codes or specifications.

Regulation 10 – Filling capacity of tanks and cylinders

(1) The owner of a tank shall not set a fixed maximum level device fitted to the tank other than at a setting such that, at a temperature of –

(a) 47.5 degrees centigrade, the tank will not be more than 97% full of liquefied petroleum gas in liquid form; and

(b) 52.5 degrees centigrade, the tank will not be full of liquefied petroleum gas in liquid form.

(2) No person shall fill a tank or cylinder with liquefied petroleum gas other than such that, at a temperature of –

(a) 47.5 degrees centigrade, the tank will not be more than 97%, and the cylinder will not be more than 95%, full of liquefied petroleum gas in liquid form; and

(b) 52.5 degrees centigrade, the tank or cylinder will not be full of liquefied petroleum gas in liquid form.

Regulation 11 – Requirements for liquefied petroleum gas storage installations

The owner of a liquefied petroleum gas storage installation shall ensure that –

(a) the installation is well-ventilated;

GN	29. The guidance notes for a well-ventilated liquefied petroleum gas storage installation , stipulated under Regulation 11(a) of Cap.51B, are set out below: (a) The liquefied petroleum gas installation should be well ventilated utilizing air inlets and outlets arranged to provide air movement across the floor of the installation as uniform as practicable. In the event of LPG release, the gas should be able to disperse and the risk of escaping LPG being ignited before being dispersed or diluted should be minimized as far as practicable.

(b) Unless otherwise approved by the Gas Authority, the owner of a liquefied petroleum gas storage installation should not carry out alteration work to the installation which may adversely affect the natural ventilation of the installation.

(c) For any LPG installation which was approved to operate by natural ventilation, the owner should maintain all ventilation openings of the installation unobstructed at all times. For store rooms where natural ventilation is provided through ventilation apertures, the owner of a store should maintain a clearance of not less than 150 mm between the ventilation apertures of the store room and the mini tanks, cylinders and/or equipment so as to prevent blockage of the ventilation apertures.

(d) The design of ventilation apertures should be in accordance with the Code of Practice for Hong Kong LPG Industry, Module 1 – "LPG Compounds and Cylinder Stores".

(e) For any liquefied petroleum gas storage installation which was approved to operate by mechanical induced ventilation, the owner should provide effective gas monitoring and alarm systems to alert people in the vicinity of the installation when the existence of LPG vapours is detected. There should be a direct telephone link to transmit the alarm signal to the Fire Services Department.

(f) The owner of a liquefied petroleum gas storage installation which was approved to operate by mechanical induced ventilation should ensure that the ventilation system is operating at all times and should implement an audio and visual alarm system indicating failure of the mechanical ventilation system such as interruption of electrical supply, failure of extraction fan, etc. should be provided for the system. The owner should forthwith restore the ventilation system to operative upon receiving the audio and visual alarm.

(g) Electrical equipment for use in the mechanical ventilation system should be certified for use in appropriate classified hazardous zone.

(h) The owner of a liquefied petroleum gas storage installation should ensure that the installation will remain effectively ventilated such that the ventilation will not be impaired by adjacent buildings or

	structures, irrespective of whether the buildings or structures are erected before or after the LPG installation. (i) In case the owner could not ensure the ventilation of a liquefied petroleum gas storage installation operating effectively, the owner should cease using the installation to store LPG until the problem is rectified.

(b) the installation is accessible for

(i) the replacement and maintenance of the tanks or cylinders which comprise the installation; and

(ii) fire-fighting purposes in the event of a fire in or near the installation;

GN	30. To fulfil the Regulation 11(b) of Cap.51B, the owner of a liquefied petroleum gas storage installation should not use the installation to store LPG unless the installation is free from obstruction anytime.

(c) any safety feature provided for the installation, being a radiation wall, fixed water drenching system or diversion kerb, together with the distances between the tanks or cylinders which comprise the installation and any –

(i) property boundary;

(ii) fixed source of ignition; or

(iii) building other than the building in which the installation is situated, are such that-

(A) the risk of any liquefied petroleum gas escaping from the installation being ignited before being dispersed or diluted is, so far as is practicable, minimized; and

(B) the installation is protected against the radiation effects of any fire occurring outside the installation;

GN	31. For the purpose of Regulation 11(c) of Cap.51B, the owner of a liquefied petroleum gas storage installation should meet the following requirements: (a) The owner should ensure that all radiation walls, if provided, should be of a fire resistance rating of not less than 2 hours in accordance with the Code of Practice for Fire Safety in Buildings issued by Buildings Department. (b) Unless suspension with notification to Fire Services Department, the owner should ensure that all water drenching systems, if provided, are operative at all times. The owner should ensure that the water

	drenching systems are periodically tested by a fire services installation contractor or person who is approved by the Director of Fire Services. (c) The owner should ensure that the separation distances between the tanks or cylinders and the property boundary, fixed source of ignition or building are not less than the minimum requirements as specified in, as appropriate, (i) Code of Practice for Hong Kong LPG Industry, Module 1 – "LPG Compounds and Cylinder Stores"; (ii) Code of Practice for Liquefied Petroleum Gas Filling Stations in Hong Kong; (iii) Guidelines for LPG Vehicle Fuel System Maintenance Workshop; (iv) Guideline for Setting Up of Liquefied Petroleum Gas Cylinder Store; (d) For separation distances between the tank or cylinder and the property boundary, the distances may be measured around the corners of radiation walls or diversion kerb if available. (e) For separation distances between the tank or cylinder and fixed source of ignition, the distances may be measured around the corners of radiation wall if available. (f) Electrical apparatus should be considered as sources of ignition for the purpose of this sub-regulation unless the electrical apparatus is certified for use within the hazardous areas classified in Code of Practice for Hong Kong LPG Industry, Module 1 – "LPG Compounds and Cylinder Stores".

(d) ventilation and explosion relief measures other than explosion relief panels are provided for the installation; and

GN	32. The guidance notes for ventilation and explosion relief measures as required in Regulation 11(d) of Cap.51B are as follows: (a) The design of explosion relief apertures should be in accordance with the Code of Practice for Hong Kong LPG Industry, Module 1 – "LPG Compounds and Cylinder Stores". (b) Imperforated explosion relief panels should not be used.

	(c) Ventilation apertures may be included as explosion relief apertures. (d) For LPG store within a vehicle workshop, ventilation utilizing air inlets and outlets should be arranged in accordance with the Guideline for LPG Vehicle Fuel System Maintenance Workshop.

(e) where the installation is part of a piped gas supply system and more than one tank or cylinder which comprises the installation is at any one time providing liquefied petroleum gas to such system by means of flexible gas tubing connected to a common manifold, the installation has incorporated in it safety devices which will ensure that if such tubing between one such tank or cylinder and the common manifold fails, such failure does not cause the complete loss of such gas from any other tank or cylinder which is connected by such tubing to such manifold.

GN	33. For the purpose of Regulation 11(e) of Cap.51B, the safety device consisting of a stop valve with check function should be installed between the flexible gas tubing and the manifold system for all tanks and cylinders. In the case of liquid withdrawal tanks or cylinders, one particular tank or cylinder of each bank should be installed with a stop valve with excess flow device to allow liquid LPG to flow back from the vaporiser.

Regulation 12 – Requirements for tanks

(1) The owner of a tank which is placed –

(a) below ground level; or

(b) above ground level and covered with sand or earth,

shall not use the tank to contain liquefied petroleum gas unless the tank –

(i) is covered with a coating material-

(A) bonded to all external surfaces of the tank; and

(B) which will protect the tank against corrosion; and

GN	34. To achieve the purposes stipulated in Regulation 12(1)(i)(A) and 12(1)(i)(B) of Cap.51B, the coating materials should meet the following guidance notes: (a) Exterior surface of a tank should be treated to exclude all rust, grease and dust prior to applying surface coating. (b) The coating material should have a minimum dry film thickness of not less than 400 μm. (c) The coating should pass a Holiday test. (d) Immediately prior to burying, tanks should be visually

	inspected for any damage to the coating.

(ii) is fitted with a cathodic protection system together with a test point for such system.

GN	35. The design life of the cathodic protection system required under Regulation 12(1)(ii) of Cap.51B should be sufficient for the system to work properly until next test and examination stipulated in Regulation 8(4) of Cap.51B. The owner of an LPG installation should keep the design documents for the period the system is in use, and be available for inspection by Gas Safety Inspector when request.

(2) The owner of a tank which is fitted with a cathodic protection system as required by subregulation (1)(ii) shall cause such system to be tested not less than once in each 6 months period and the results of such test to be recorded in writing and retained until the tank ceases to be used to contain liquefied petroleum gas.

GN	36. The record of test result required under Regulation 12(2) of Cap.51B should include statement about whether the tank is adequately protected by the cathodic protection system, with all details including the methods and standards of measurement, training and/or qualification of the person who carried out the test, equipment used and its calibration, analysis of the measured results against the acceptance criteria of a national or international standard etc.

PART IV – REQUIREMENTS FOR VAPORISERS

Regulation 13 – Provision of shut-off valves for vaporisers

No person shall use any vaporiser to vaporise liquefied petroleum gas unless shut-off valves have been fitted to each liquid or vapour line between the vaporiser and the container for which it is provided.

Regulation 14 – Testing and examination of vaporisers

(1) The owner of a vaporiser shall not use the vaporiser to vaporise liquefied petroleum gas unless the vaporiser has been tested and examined not less than once –

(a) in the case of a direct-fired vaporiser, within the 12 months period immediately preceding such use; and

(b) in the case of any other vaporiser, within the 5 years period immediately preceding such use,

to ascertain whether the vaporiser is safe to be so used.

GN	37. The guidance notes for the test and examination of vaporiser as stipulated under Regulation 14(1) of Cap.51B are as follows: (a) The owner of a vaporiser should ensure that the vaporiser will be purged out of service before it is due for the test and examination as required under Regulation 14(1). (b) The owner of a vaporiser should only permit the re-commissioning of the vaporiser after he has ascertained that the vaporiser is safe for use to vaporise LPG based on the results of test and examination required under Regulation 14(1) in accordance with the relevant design / inspection code and that the test and examination were conducted within the period as stipulated under Regulation 14(1). (c) The scope of test and examination of a vaporiser, stipulated under Regulation 14(1) of Cap.51B, should include the test and examination of its safety devices. For direct fired vaporizer, the thermostat, thermocouple, liquid inlet valve, capacity control valve, heat exchanger and main burner assembly should be checked. For water bath vaporizer, safety devices such as water bath temperature control, low water level cut-off, pressure relief valve, high temperature cut-off, liquid outflow cut-off should be checked during the test and examination. For electric vaporizer, temperature control sensor, overheat cut-off, liquid inlet valve, pressure relief valve, liquid outflow cut-off valve, heating element and electrical assembly should be checked. (d) The pressure containing element of a vaporiser should be hydrostatically tested. The test pressure should follow the relevant design code and be maintained for the specified duration. (e) After re-assembling all critical components, the vaporiser should be subjected to functional tests and a leak test. (f) The fitness for use of the vaporiser to vaporise LPG should, on the basis of the results of the required test and examination, be certified by a competent person or by an inspection body which has been accredited by a national certification body to ISO17020 for carrying out such test and examination. (g) A vaporiser is considered as having been ascertained as safe for use to vaporise LPG if the competent person or the inspection body who conducted the certification has, based on the results of the test and examination,

	certified that the vaporiser is safe for such use. (h) If various tests are carried out in different dates to a vaporiser during the process of periodic test and examination, the date of the hydrostatic test should be regarded as the test date of the vaporiser on which the date of next test and examination is based. (i) If the design specification requires a vaporiser to be tested and examined at a frequency which is different from once every five years, the more frequent requirements should be followed.

(2) The owner of a vaporiser shall keep a written record of the results of any test and examination carried out on the vaporiser pursuant to subregulation (1) until the vaporiser ceases to be used to vaporise liquefied petroleum gas.

(3) Where any test and examination carried out on a vaporiser pursuant to subregulation (1) shows that the vaporiser is not safe to be used to vaporise liquefied petroleum gas, the owner of that vaporiser shall not so use the vaporiser unless work has been subsequently carried out on the vaporiser which renders the vaporiser safe to be so used.

Appendix 1

References

1. Code of Practice for Hong Kong LPG Industry, Module 1 – “LPG Compounds and Cylinder Stores”, The Gas Standards Office of Electrical and Mechanical Services Department and The LPG Safety and Technical Committee.

2. Code of Practice for Hong Kong LPG Industry, Module 2 – “Underground LPG Pipework”, The Gas Standards Office of Electrical and Mechanical Services Department and The LPG Safety and Technical Committee.

3. Code of Practice for Hong Kong LPG Industry, Module 3 – "Handling and Transport of LPG in Bulk by Road", The Gas Standards Office of Electrical and Mechanical Services Department and The LPG Safety and Technical Committee.

4. Code of Practice for Hong Kong LPG Industry, Module 7 – "Operating Procedures for Emergencies for LPG Compounds and Cylinder Stores", The Gas Standards Office of Electrical and Mechanical Services Department and The LPG Safety and Technical Committee.

5. Code of Practice for Hong Kong LPG Industry, Module 9 – "LPG Cylinders", The Gas Standards Office of Electrical and Mechanical Services Department and The LPG Safety and Technical Committee.

6. Code of Practice for Liquefied Petroleum Gas Filling Stations in Hong Kong, The Gas Standards Office of Electrical and Mechanical Services Department.

7. Guidance Note on – "Storage of Disposable LPG Cylinders in Stores Other Than Retail Outlets", The Gas Standards Office of Electrical and Mechanical Services Department.

8. Guidance Note GU18 – "Safety of LPG Lighters", The Gas Standards Office of Electrical and Mechanical Services Department.

9. Guidance Note GU19 – "Safety of Disposable LPG Cylinders", The Gas Standards Office of Electrical and Mechanical Services Department.

10. Guideline for LPG Vehicle Fuel System Maintenance Workshop, The Gas Standards Office of Electrical and Mechanical Services Department.

11. Guideline for Setting Up of Liquefied Petroleum Gas Cylinder Store, The Gas Standards Office of Electrical and Mechanical Services Department.

12. ASME Section VIII-DIV 1, “ASME Boiler and Pressure Vessel Code, Section VIII, Division 1: Rules for Construction of Pressure Vessels”, The American Society of Mechanical Engineers.

13. PD5500, “Specification for Unfired, Fusion Welded Pressure Vessels”,

The British Standards Institution.

14. AS1210, “Australian Standard for Design and Construction of Pressure Equipment”, Standards Australia.
15. AS 3788, “Boiler and Pressure Vessels-In-Service Inspection”, Standards Australia.
16. API 510, “Pressure Vessel Inspection Code: Maintenance Inspection, Rating, Repair and Alteration”, The American Petroleum Institute.
17. API 579, “Fitness-for-Service”, The American Petroleum Institute.
18. NACE RP-02-85, “Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems”, The National Association of Corrosion Engineers

Appendix 2

Gazette Notice 5722 in Gazette No. 50/1996

G.N. 5722

GAS SAFETY (GAS SUPPLY) REGULATIONS (CHAPTER 51)
(Regulation 6C of Part IIA)

INSPECTIONS TO BE CARRIED OUT BY
OWNER OF NOTIFIABLE GAS INSTALLATION

Notice is hereby given by the Gas Authority under Regulation 6C(1) of the Gas Safety (Gas Supply) Regulations that, with effect from 1 January 1997,

(a) the owner of a liquefied petroleum gas installation referred to in paragraph (f) of 'notifiable gas installation' as defined under section 2 of the Gas Safety Ordinance (Chapter 51) shall employ a competent person to carry out inspection on the installation to ascertain whether the installation is maintained and operated in accordance with Regulation 6B of the aforementioned Regulations;

(b) the inspections shall be carried out at intervals of not less than once every year;

(c) inspection reports of the installation in the format of the following form shall be kept by the owner for the service life of the installation; and

(d) a copy of the inspection report shall be submitted to the Gas Authority by the owner within four weeks after an inspection.

FORM

ANNUAL INSPECTION REPORT OF LPG INSTALLATION

Section I Particulars of LPG Installation

Location:
Owner:
Gas Supply Company:
Maintenance Contractor:
Type of Installation:
Storage Quantity:
Mode of Storage:

Section II Inspection Checklist

A. Site Condition

1. Structures/fitments within safety distances
2. Condition of sterile area
3. Condition of fence/boundary walls/gates
4. Housekeeping
5. Condition of catchment pits/gully covers
6. Type and number of certified unexpired fire extinguishers

B. Record of Maintenance and Alterations

1. Maintenance records
2. Alteration records

C. Vaporiser Room*

1. Housekeeping of vaporiser room
2. Condition of ventilation and explosion relief
3. Condition of vaporisers
4. Condition of Pressure Relief Valves (PRVs) and vent pipes
5. Date of vaporiser revalidation
6. Record of routine test of fire fighting system

D. Pipework/Equipment*

1. Condition of pipework/pressure regulators/valves/gauges/fittings
2. Identification markings of pipework/valves/fittings
3. Identification and functional markings of main control valve
4. Date of pipework test
5. Date of hydrostatic pressure relief valve replacement

E. Bulk Tanks & Tanker Bay*

1. Condition of valve chambers
2. External condition of vessel chambers
3. Internal condition of vessel chamber (ingress of water)
4. Provision of rain caps at PRV vent pipes, valve chamber covers, etc.
5. Condition of PRVs and vent pipes
6. External condition of aboveground tanks
7. Condition of earthing/bonding connection
8. Condition of breakaway coupling/loading arm
9. Date of tank revalidation
10. Record of cathodic protection test
11. Record of routine test of fire fighting system

F. Cylinder Store*

1. Housekeeping of cylinder store
2. Condition of ventilation and explosion relief
3. Date of replacement of flexible gas tubings
4. Record of routine test of fire fighting system

Section III Recommendations and Remedial Work

(A) Recommendations by competent person
(B) Remedial work done by owner

* if applicable

H.B. PHILLIPSON *The Gas Authority*