

BUILDING SERVICES BRANCH
TESTING AND COMMISSIONING
PROCEDURE NO. 8
FOR
LIQUEFIED PETROLEUM GAS INSTALLATION
IN
GOVERNMENT BUILDINGS
HONG KONG

² **HONG KONG SPECIAL ADMINISTRATIVE REGION GOVERNMENT**

Building Services Branch
Architectural Services Department
(2000 Edition)

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TABLE OF CONTENT

		Page
1.	Introduction	1
2.	General Requirements	1
3.	Testing and Inspection	2
4.	Statutory Inspection/Commissioning	2
5.	Calibrated Equipment	3
<u>Appendix A</u>		
Testing and Commissioning Certificate on Liquefied Petroleum Gas Installation		
Part 1 :	Details of Project	1
Part 2 :	Declaration	1
Part 3 :	Items Inspected and Tested	2
3.1	Inspection, Testing and Commissioning of Piping System	2
3.2	Inspection, Testing and Commissioning of Bulk LPG Storage System	6
3.3	Inspection, Testing and Commissioning of LPG Cylinder Storage System	11
3.4	Inspection, Testing and Commissioning of Vaporizers	11
3.5	Inspection, Testing and Commissioning of LPG Appliances	12
3.6	Inspection for Hazard Precaution and fire Prevention	14
3.7	Functional Test	15
3.8	Performance Test	15
3.9	Comments	15
Part 4 :	Test Record attached to the Test Certificate	16
4.1	Pressure test of pipework before treated, concealed or buried	16
4.2	Pressure test of pipework on completion	17
4.3	Function test on valves	18

TABLE OF CONTENT

	Page	
4.4	Function test on pressure regulation devices	19
4.5	Test on electrical continuity of LPG installation	20
4.6	Test on earthing system	21
4.7	Insulation test on electrical installation	22
4.8	Test certification for pipework	23
4.9	Test certification for *pressure relief valves/hydrostatic relief valves	24
4.10	Test certification for excess flow valves	25
4.11	Test certification for pressure gauges	26
4.12	Test certification for LPG storage facilities	27
4.13	Testing Equipments	28
4.14	Factory Test Certificates for Gas Appliances	29

Appendix B

Testing and Commissioning progress chart for Liquefied Petroleum Gas Installation

Appendix C

EMSD/GSO/106 Testing and Examination of LPG Tank under Regulation 8 of Gas Safety (Gas Supply) Regulations, Cap. 51

EMSD/GSO/107 Testing and Examination of LPG Vaporiser under Part IV of Gas Safety (Gas Supply) Regulations, Cap. 51

EMSD/GSO/108 Testing and Examination of LPG Pipes under Part V of Gas Safety (Gas Supply) Regulations, Cap. 51

B.S.B. Testing and Commissioning Procedure No. 8

Liquefied Petroleum Gas Installation

1. Introduction

- 1.1 This procedure is intended to lay down the minimum testing and commissioning requirements to be carried out by the Contractor on a new Liquefied Petroleum Gas (L.P. Gas) Installation upon completion or on an existing L.P. Gas installation after a major alteration. Additional testing and commissioning (T & C) requirements may be proposed and submitted by the Contractor as appropriate and agreed by the Project Building Services Engineer (PBSE) for special equipment supplied and/or installed by the Contractor.
- 1.2 This procedure is also written to facilitate the PBSE and Project Building Services Inspector (PBSI) in carrying out the following aspects of work with respect to T & C.
 - (i) To vet and approve the T & C procedures proposed and submitted by the Contractor.
 - (ii) To witness those T & C procedures as specified.
 - (iii) To receive the T & C certificate and other supporting data.

2. General Requirements

- 2.1 The Contractor shall submit the T&C procedures, T&C detailed programme together with the Testing and Commissioning progress chart in appendix B to the PBSE for approval. The submission shall be made at least one month before the commencement of T&C.
- 2.2 Where tests are required to be witnessed by the PBSE/PBSI, the Contractor shall give due advance notice (usually not less than three days) and provide details of date, time and type of tests to be performed.
- 2.3 Upon completion of such T & C procedure, the Contractor shall complete and sign a testing and commissioning certificate as Appendix A, to the effect that agreed T&C procedures have been duly carried out.
- 2.4 Before carrying out any test, the Contractor shall ensure that the installation complies fully with the relevant statutory obligations and regulations.
- 2.5 The installation shall generally comply with the requirements of the L.P. Gas General Specification (LPGGS) unless specified otherwise in the Particular specification which shall take precedence. The installation shall comply with Gas Safety Regulations in Gas Safety Ordinance.

- 2.6 Items to be buried underground shall be inspected and tested before protective finishing is applied and the finished work is buried. The Contractor shall arrange Gas Authority to inspect and witness the tests including pressure test and “Holiday test” for the underground pipeline and storage tanks prior to cover up/back-filling.
- 2.7 Where portions of the L.P. Gas Installation may only be accessible by making use of the builder’s temporary facilities, such as scaffolding, the Contractor shall invite the PBSE/PBSI staff to carry out inspection and/or witness any tests before the removal of the temporary facilities.

3. Testing and Inspection

- 3.1 The requirements are in general as specified in the latest General Specification for Liquefied Petroleum Gas Installation, herein after described as General Specification. If there is any discrepancy between this procedure and the General Specification, the General Specification shall take precedence.
- 3.2 The Contractor shall carry out the tests and inspections as shown in Part 3 and record the test results on Part 4 of Appendix A and as agreed between the PBSE and the Contractor. All tests shall be properly recorded during and immediately after the test. A commissioning and testing report shall be submitted within fourteen days after completion of commissioning and testing the installation.
- 3.3 The Contractor shall provide all the necessary staff, labour, materials, fuels and equipment for a thorough test and examination of the installation.

4. Statutory Inspection/Commissioning

- 4.1 After the proper testing and commissioning of the L.P. Gas Installation, the Contractor shall notify the appropriate Authority, through PBSE, on the completion of the installation and its readiness of inspection and testing. Before testing and commissioning of LPG installation, the “Competent Person” of the Contractor shall check that fire protection system for the LPG installation, if provided, should have been tested and accepted by Fire Services Department and put into operation.
- 4.2 The L.P. Gas Installation can only be put into use after it has been inspected, tested and approved by the appropriate Authority. Approval of use from the Authority shall be obtained by the Contractor before filling up the LPG storage tank or supplying LPG cylinders for commissioning.
- 4.3 When submitting the testing certificate(s) EMSD/GSO/106, 107, 108 as shown on Appendix C to the Gas Authority, a copy of the same certificate(s) shall be provided to PBSE for record purpose.

4.4 The Contractor shall make all necessary applications to the appropriate Authority and attend to the inspections conducted by their representatives. Additional tests and inspection, where not specified above, shall also be carried out to meet the statutory requirements to the satisfaction of the appropriate Authority.

5. Calibrated Equipment

5.1 The Contractor shall supply calibrated equipment as stipulated in the Specification of the Contract for the inspection, measuring and testing of the installation. The equipment shall be calibrated by laboratories accredited by the Hong Kong Laboratory Accreditation Scheme (HKLAS) or other recognised accredited laboratories.

Testing and Commissioning Certificate on Liquefied Petroleum Gas Installation

Part 1 : Detail of Project

- 1.1 Project title (with location) :
- 1.2 * P.W.P. / Project No. :
- 1.3 *Contract/sub-contract/Quotation No. :
- 1.4 * Contractor/Sub-contractor :
- 1.5 PBSE :
- 1.6 PBSI :

Part 2 : Declaration

- 2.1 I certify that the Liquefied Petroleum Gas Installation as specified in the Contract/Sub-contract/Quotation at the above location has been inspected, tested and commissioned in accordance with this procedure and/or any other procedures agreed between the PBSE and the Contractor. The results are satisfactory in the aspects as mentioned in Part 3 and/or as recorded in Part 4 of this Certificate, except as indicated in the COMMENTS items.
- 2.2 I also certify that site tests have been performed in accordance with the requirements set out in Appendix A of this procedure and that the results are satisfactory. A record of the tests has been prepared and submitted to the PBSE.

Certified by Competent Person _____

Full Name of Competent Person _____

Signature of Contractor's Representative _____

Full Name of Contractor's Representative _____

Designation of Contractor's Representative _____

Name and Stamp of Contractor _____

Date _____

Note : This certificate must be signed by a person authorized by the Firm/Company and certified by a Competent Person of the Firm/Company.

* Delete if not applicable

Items tested
checked by
Contractor

Items witnessed
by
PBSE/PBSI

Part 3. Items Inspected and Tested

3.1 Inspection, Testing and Commissioning of Piping System

3.1.1 Visual Inspection

3.1.1.1 Steel and Copper Pipework

- | | | | |
|----|--|---------|---------|
| a) | Are all pipelines of the correct types and approved by the PBSE? | *Yes/No | *Yes/No |
| b) | Are all pipelines up to 13 mm bore of steel or copper made? | *Yes/No | *Yes/No |
| c) | Are all pipelines above 13 mm bore of steel made? | *Yes/No | *Yes/No |

3.1.1.2 Flexible Hoses and Tubing

- | | | | |
|----|--|---------|---------|
| a) | Are all flexible hoses and tubing of correct types and approved by the PBSE ? | *Yes/No | *Yes/No |
| b) | Are corrosion resistant braiding for flexible hoses and tubing used? | *Yes/No | *Yes/No |
| c) | Are emergency valves installed in all liquid pipelines to which the flexible hoses are connected? | *Yes/No | *Yes/No |
| d) | Are emergency valves installed in all vapour pipelines at high pressure stage to which the flexible hoses are connected? | *Yes/No | *Yes/No |
| e) | Are manual shut-off valves installed for vapour pipelines at intermediate pressure or below to which the flexible hoses are connected? | *Yes/No | *Yes/No |
| f) | Are all flexible tubing within 2 m long and marked with "LPG" and tagged with a label indicating the date of next replacement? | *Yes/No | *Yes/No |
| g) | Is any flexible tubing extended from one room to another or passing through wall or ceiling? | *Yes/No | *Yes/No |

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Items tested
checked by
Contractor

Items witnessed
by
PBSE/PBSI

- | | | | |
|----------------------------------|--|---------|---------|
| h) | Are all end fittings of the flexible hoses and tubing of correct and approved type? | *Yes/No | *Yes/No |
| i) | Are fittings for securing flexible hoses and tubing free from burrs/sharp edges and not over-tightened? | *Yes/No | *Yes/No |
| 3.1.1.3 Pipe Joints and Fittings | | | |
| a) | Are all steel pipe joints over 50 mm bore welded or welded flanged? | *Yes/No | *Yes/No |
| b) | Is only electric arc welding used on steel pipes of 125 mm bore and larger. | *Yes/No | *Yes/No |
| c) | Are copper pipe joints of compression type or sweated type silver soldered or brazed using jointing material of melting point exceeding 540°C? | *Yes/No | *Yes/No |
| d) | Are pipe fittings of the correct and approved types? | *Yes/No | *Yes/No |
| e) | Are gaskets used resistant to LPG? | *Yes/No | *Yes/No |
| 3.1.1.4 Piping Installation | | | |
| a) | Are pipeworks installed in accordance with the approved drawings? | *Yes/No | *Yes/No |
| b) | Are all pipeworks buried in floor slabs protected against corrosion and mechanical damage? | *Yes/No | *Yes/No |
| c) | Are surface pipeworks adequately supported and are the supports made of correct materials and correctly constructed? | *Yes/No | *Yes/No |
| d) | Are the pipe runs having adequate flexibility and facilities to compensate for thermal expansion and contraction of pipes, or mechanical stress at branch pipes? | *Yes/No | *Yes/No |
| e) | Are insulations provided in pipe supports where cathodic protection has been provided? | *Yes/No | *Yes/No |
| f) | Are all pipeworks protected against corrosion by wrapping, galvanizing or painting as appropriate? | *Yes/No | *Yes/No |

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

Items tested
checked by
Contractor

Items witnessed
by
PBSE/PBSI

- | | | | |
|--------------------------------|--|---------|---------|
| g) | Are pipeworks passing through walls or floor slabs properly wrapped and enclosed in metal sleeves and without joints? | *Yes/No | *Yes/No |
| h) | Is recondensation of LPG expected in any section of pipework and, if so, has thermal insulation been provided? | *Yes/No | *Yes/No |
| i) | Is a minimum clearance of 150 mm maintained between LPG pipes and electric conduits, trunking and cables? | *Yes/No | *Yes/No |
| j) | Are all pipeworks buried underground adequately treated and protected against corrosion and mechanical damage, especially those sections at road crossing? | *Yes/No | *Yes/No |
| k) | Are all underground pipeworks outside premises buried at a depth of not less than 800 mm and at a minimum clearance of 200 mm from electrical cables? | *Yes/No | *Yes/No |
| l) | Have pipe markers been fixed to indicate the route of buried pipelines? | *Yes/No | *Yes/No |
| m) | Have LPG identification labels been provided for all surface LPG distribution pipes? | *Yes/No | *Yes/No |
| 3.1.1.5 Valves and Accessories | | | |
| a) | Are all valves of correct and approved types? | *Yes/No | *Yes/No |
| b) | Are all valves accessible and with clear indication of direction of operation? | *Yes/No | *Yes/No |
| c) | Are all excess flow valves and non-return valves installed in the correct direction? | *Yes/No | *Yes/No |
| d) | Are all pressure relief valves fitted with vent connections of correct length and chained self-detachable weatherproof cap? | *Yes/No | *Yes/No |
| e) | Are all pressure relief valves clearly and permanent marked with manufacturer's identification, discharge pressure and certified capacity? | *Yes/No | *Yes/No |
| f) | Are the connection fittings of the strainer and solenoid valve at the LPG liquid lines of welded flange type? | *Yes/No | *Yes/No |

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

Items tested
checked by
Contractor

Items witnessed
by
PBSE/PBSI

- g) Are enclosures for LPG meters provided with sufficient ventilation? *Yes/No *Yes/No
- h) Are LPG traps filled with water *Yes/No *Yes/No
- 3.1.1.6 Pressure Regulating and Monitoring Devices
- a) Are all pressure regulators/governors of correct and approved types? *Yes/No *Yes/No
- b) Are all pressure regulators/governors sealed and locked against unauthorized adjustment? *Yes/No *Yes/No
- c) Are all first stage pressure regulating devices located as closer as practicable to the storage vessel or vaporizer? *Yes/No *Yes/No
- d) Are isolating valves provided at both upstream and downstream of regulators? *Yes/No *Yes/No
- 3.1.2 Testing and Commissioning
- 3.1.2.1 Pipework
- a) All pipeworks have been pressure and leak tested, by means of *pressure drop hydraulic method/soap and water pneumatic method, before and after applying corrosion treatment, concealed or buried. *Yes/No *Yes/No
- b) Before pressure testing, the units which are not capable of sustaining the test pressure have been isolated. *Yes/No *Yes/No
- c) Results of pressure test on pipeworks were as shown in the "Record of Tests" and were considered to be satisfactory. *Yes/No *Yes/No
- 3.1.2.2 Valves and Accessories
- a) During the pressure testing, have all isolating valves and quick-acting shut-off valves been checked and is there no leakage through them at their fully closed positions? *Yes/No *Yes/No
- b) Have all non-return valves been checked and found to be functioning properly? *Yes/No *Yes/No
- c) Have all excess flow valves been checked and could they close upon excessive discharge within 1.5 time of the normal service flow rates? *Yes/No *Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

	Items tested checked by Contractor	Items witnessed by PBSE/PBSI
d) Have all pressure relief valves been calibrated and keep installation sealed by manufacturer or competent person and are the testing certificates enclosed to the "Record of Tests"?	*Yes/No	*Yes/No
e) Have all pressure relief valves vent caps been in place and mobile?	*Yes/No	*Yes/No
f) Are all pressure gauges working properly and reading correct figures?	*Yes/No	*Yes/No
g) Are all emergency valves checked for proper functioning?	*Yes/No	*Yes/No
h) Are all valves and regulators checked on the tight shut-off with zero flow?		
3.1.2.3 Pressure Regulating and Monitoring Devices		
a) Have all pressure regulating devices been set to provide specified and approved downstream working pressures?	*Yes/No	*Yes/No
b) Have all active monitor regulators been set so that they will close when slightly higher downstream pressure is sensed?	*Yes/No	*Yes/No
c) Are all service governors set correctly and working properly?	*Yes/No	*Yes/No
d) Are all under pressure shut off devices and over pressure shut off devices working properly?	*Yes/No	*Yes/No
e) Are all internal relief valves, if equipped, of regulators/governors working properly at a pressure increase of 2 kPa at downstream?	*Yes/No	*Yes/No
3.2 <u>Inspection, Testing and Commissioning of Bulk LPG Storage System</u>		
3.2.1 Visual Inspection		
3.2.1.1 Storage Vessels		
a) Are the storage vessels of the correct models and constructed exactly in accordance with the construction drawings which have been approved by the PBSE?	*Yes/No	*Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

	Items tested checked by Contractor	Items witnessed by PBSE/PBSI
b)	Are correct and visible data plate permanently fixed on the storage vessels?	*Yes/No
c)	Have details of information on the data plates been included in the "Record of Tests"?	*Yes/No
d)	For above ground vessels over 5000 litres water capacity or where piers are used as part of the vessel support : Are the vessels secured at the end where the principal liquid and vapour lines are attached while the other end being free to move?	*Yes/No
e)	For underground vessels : Are the vessels secured at both ends against flotation and against movement at the end to which the connections are made?	*Yes/No
f)	For horizontal vessels : Are the vessels sloped slightly towards the drain connection?	*Yes/No
g)	For vertical vessels : Are the skirts provided with at least two vents?	*Yes/No
h)	For underground vessels : Are all fittings on the vessel accessible above ground level?	*Yes/No
3.2.1.2	Pressure Relief Valves	
a)	Is each vessel provided with pressure relief valve(s) as designed?	*Yes/No
b)	For vessel with only one pressure relief valve, does the automatic shut off valve comply with the requirements as specified in the LPGGS?	*Yes/No
3.2.1.3	Vent Pipes	
a)	For vessels over 5000 litres water capacity and for all underground vessels : Are adequately supported vent pipes installed?	*Yes/No
b)	Are outlets of vent pipes at least 2 m above top of vessels and 3 m above ground level?	*Yes/No
c)	Have means been provided in vent pipes for drainage of water?	*Yes/No
d)	Are vent pipes provided with loose fitting captive rain caps?	*Yes/No

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
e)	For vessels fitted with protective covers : Are vents provided to direct the discharged LPG away from the vessel shell?	*Yes/No	*Yes/No
3.2.1.4	Shut Off Valves and Emergency Valves		
a)	Are shut off valves provided for vessel connection in accordance with the LPGGS?	*Yes/No	*Yes/No
b)	Are emergency valves provided for vessel connection in accordance with the LPGGS?	*Yes/No	*Yes/No
c)	Are remotely controlled emergency valve operated from safe area and of the fail-safe type?	*Yes/No	*Yes/No
3.2.1.5	Drain Connection		
a)	Are drain pipes with first and second shut off valves provided in accordance with the LPGGS?	*Yes/No	*Yes/No
b)	Are drain pipes or blow-off lines having discharge outlets away from any other drainage systems?	*Yes/No	*Yes/No
c)	Are outlets of drain system blank-flanged, plugged, otherwise secured against tampering when not in use?	*Yes/No	*Yes/No
d)	Are sections of drain pipes between valves and plugged outlets fitted with hydrostatic pressure relief valves?	*Yes/No	*Yes/No
3.2.1.6	Gauges		
a)	Are pressure gauge (connected to the vapour space), temperature gauge, fixed maximum liquid level device and content gauge provided for each vessel?	*Yes/No	*Yes/No
b)	For content gauge which relies on bleeding to atmosphere : Is bleeding hole not larger than 1.4 mm or otherwise protected by a shut off valve and a suitable emergency valve?	*Yes/No	*Yes/No
c)	Is pressure gauge connection protected by tapping reduced internally to a bleeding hole not larger than 1.4 mm or by a suitable excess flow valve and a shut off valve?	*Yes/No	*Yes/No

3.2.1.7 Filling Connections

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

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(Name(s) of *PBSE/*PBSI)

Appendix A

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
a)	Are an emergency valve and a shut off valve provided for each filling connection?	*Yes/No	*Yes/No
b)	Is filling connection for each vessel located at suitable location within the storage fence area and close to, but not under, the vessel?	*Yes/No	*Yes/No
c)	Are "Liquid" and "vapour" labels provided for offset/remote filling connections?	*Yes/No	*Yes/No
3.2.1.8	Maximum Permitted Filling Volume		
a)	Is the initial filling below the maximum permitted filling volume in accordance with LPGGS?	*Yes/No	*Yes/No
3.2.1.9	Finishing and Coating		
a)	Has a coating been applied to the exterior of each underground vessel in accordance with the LPGGS?	*Yes/No	*Yes/No
b)	Has "holiday" test been carried out after coating of an underground vessel?	*Yes/No	*Yes/No
3.2.1.10	<u>Earthing System</u>		
a)	Is each vessel electrically earthed (provided that the earthing of the vessel does not contradict to the cathodic protection requirement)?	*Yes/No	*Yes/No
b)	Is an earthing terminal provided near the LPG filling point for the connection of the bulk tanker vehicle?	*Yes/No	*Yes/No
c)	Is the earthing resistance of the LPG system within 1 megaohm?	*Yes/No	*Yes/No
3.2.1.11	Cathodic Protection		
a)	Has cathodic protection been provided for each semi-underground or underground vessel?	*Yes/No	*Yes/No
3.2.2	Testing and Commissioning		
3.2.2.1	Storage Vessels		
a*)	Recognised test certificate for internal flaw on each vessel has been attached to the "Record of Tests".	*Yes/No/N.A.	*Yes/No/N.A.

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

	Items tested checked by Contractor	Items witnessed by PBSE/PBSI
* Ultrasonic/radiographic test for examining internal flaw on each vessel has been carried out. Results of the test are satisfactory.		
b*) Recognised test certificate for external flaw on each vessel has been attached to the "Record or Tests".	*Yes/No	*Yes/No
* Magnetic particle or penetrate test for examining surface flaw on each vessel has been carried out. Results of the test are satisfactory.		
c) Hydraulic test at testing pressure has been carried out for each vessel. Results of the test are satisfactory.	*Yes/No	*Yes/No
d) Commissioning pneumatic test for each vessel has been carried out. Results of the test are satisfactory.	*Yes/No	*Yes/No
e) "Holiday" test for each underground vessel has been carried out. Results of the test are satisfactory.	*Yes/No	*Yes/No
f) Leak test for connections up to minimum pressure has been carried out. Results of the test are satisfactory.	*Yes/No	*Yes/No
g) Paint thickness complies with LPGGS	*Yes/No	*Yes/No
3.2.2.2 Pressure Relief Valves		
a) Manufacturer's/competent person's certificate(s) on the calibration of the pressure relief valves for vessels is/are attached to the "Record of Tests".	*Yes/No	*Yes/No
3.2.2.3 Shut Off Valves and Emergency Valves		
a) All shut off valves and emergency valves have been checked and were working properly.	*Yes/No	*Yes/No
3.2.2.4 Gauges		
a) The content gauge(s), the maximum liquid level device(s), pressure gauge(s) and temperature gauge(s) have checked and were working properly.	*Yes/No	*Yes/No
3.2.2.5 Earthing System		
a) The earthing system has been tested and the earthing resistance was found to be satisfactory.	*Yes/No	*Yes/No

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

Appendix A

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
3.2.2.6	Cathodic Protection		
a)	The cathodic protection system has been tested and the test results are satisfactory.	*Yes/No	*Yes/No
3.2.2.7	Purging and Filling with LPG		
a)	The method and procedure for purging of vessels and filling with LPG have been in accordance with LPGGS.	*Yes/No	*Yes/No
3.3	<u>Inspection, Testing and Commissioning of LPG Cylinder Storage System</u>		
3.3.1	Visual Inspection		
3.3.1.1	For liquid-drawn system: Are hydrostatic pressure relief valves installed on each liquid line which can be isolated by valves?	*Yes/No/N.A.	*Yes/No/N.A.
3.3.1.2	For multi-cylinder system : Is the manual or automatic changeover device provided with indication showing the particular bank of cylinders are being used?	*Yes/No/N.A.	*Yes/No/N.A.
3.3.1.3	Are appropriate safety devices and by-pass piping provided in accordance with LPGGS?	*Yes/No/N.A.	*Yes/No/N.A.
3.3.1.4	Is approved type clip-on regulator for domestic installation using LPG cylinder of 15kg or less?	*Yes/No/N.A.	*Yes/No/N.A.
3.3.2	Testing and Commissioning		
3.3.2.1	Is the manual or the automatic changeover device working properly?	*Yes/No	*Yes/No
3.4	<u>Inspection, Testing and Commissioning of Vaporizers</u>		
3.4.1	Visual Inspection		
3.4.1.1	Are the vaporizers of the correct and approved type?	*Yes/No	*Yes/No
3.4.1.2	Has each vaporizer provided with a permanently fixed label as required by the LPGGS?	*Yes/No	*Yes/No
3.4.1.3	Has each vaporizer been provided with :-		
a)	high pressure relief valve?	*Yes/No	*Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
b)	liquid control device?	*Yes/No	*Yes/No
c)	non-bimetal heat input control?	*Yes/No	*Yes/No
d)	LPG drain point?	*Yes/No	*Yes/No
e)	automatic water level control?	*Yes/No	*Yes/No
f)	gauges for states of LPG?	*Yes/No	*Yes/No
g)	gauge for water temperature?	*Yes/No	*Yes/No
h)	drain valve for water chamber?	*Yes/No	*Yes/No
i)	shut off valves at both vapour and liquid LPG lines from vaporizer to storage vessel?	*Yes/No	*Yes/No
3.4.1.4	Has a suitable and permanent drain pipe been provided for the LPG drain valve?	*Yes/No	*Yes/No
3.4.1.5	Has a suitable vent pipe been provided for the pressure relief valve?	*Yes/No	*Yes/No
3.4.2	Testing and Commissioning		
3.4.2.1	The vaporizer has been hydraulic tested by competent person and the test certificate is attached to the "Record of Tests".	*Yes/No	*Yes/No
3.4.2.2.	*Manufacturer's/competent person's certificate on the calibration of the pressure relief valve for the vaporizer is attached to the "Record of Tests".	*Yes/No	*Yes/No
3.4.2.3.	Are the liquid-LPG control device, the heat input control device, the automatic water level control and all gauges in proper working order?	*Yes/No	*Yes/No
3.4.2.4.	Have the flame failure device, pilot and the main burner system been checked for proper function?	*Yes/No/N.A.	*Yes/No/N.A.
3.4.2.5	For indirect heated vaporiser using water as heating medium, have the water level safety control been checked for proper operation	*Yes/No/N.A.	*Yes/No/N.A.

3.5 Inspection, Testing and Commissioning of LPG Appliances

3.5.1 Visual Inspection

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

	Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
3.5.1.1.	Are all appliances of correct and approved models?	*Yes/No
3.5.1.2.	Have all appliances been installed properly in accordance with manufacturers' instructions?	*Yes/No
3.5.1.3.	Are the main flame and pilot flame, if provided, protected against draughts?	*Yes/No
3.5.1.4.	Are flame failure devices of approved type provided for totally enclosed and semi-enclosed burners? Are they sheltered from over-spilling and over-heating?	*Yes/No
3.5.1.5.	Are back-up overheat protective devices provided for temperature controls?	*Yes/No
3.5.1.6.	For gas-fired water heating appliances : Are low water pressure safety devices provided?	*Yes/No/N.A.
3.5.1.7.	Are gas shut-off valves provided at gas inlets of appliances and in readily accessible position?	*Yes/No
3.5.1.8.	Are flues readily accessible for inspection and maintenance? Are they properly installed where they pass through roof, ceiling and combustible materials?	*Yes/No
3.5.1.9.	For flues incorporating forced draught devices and automatically operated damper devices : Have these devices been interlocked with the gas supply to burners?	*Yes/No
3.5.1.10.	Are manual operated dampers incorporated in flue systems maintained in fixed open position?	*Yes/No
3.5.2	Testing and Commissioning	
3.5.2.1.	Are the gas supply pressure, water supply pressure and electricity supply voltage within the operating range of the appliances?	*Yes/No
3.5.2.2.	Are all safety controls and flame failure devices tested and ensured in proper working order?	*Yes/No
3.5.2.3.	Are the ignition, combustion and air supply properly sequenced for automatic combustion system?	*Yes/No
3.5.2.4.	Are all gas valves, cocks and taps gas tight and operate in satisfactory condition?	*Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>PBSE/PBSI</u>
3.5.2.5.	Are all provisions for combustion and ventilation air adequate?	*Yes/No	*Yes/No
3.5.2.4.	Are the gas/air ratio of burners be adjusted correctly for proper combustion?	*Yes/No	*Yes/No
3.5.2.5.	Are the flue systems working effectively? Are the interlocking between gas supply, forced draught devices and automatically operated dampers working properly?	*Yes/No	*Yes/No
3.5.2.6.	Are all ignition devices working properly?	*Yes/No	*Yes/No
3.5.2.7.	Are the contact temperatures of the outer casings of appliances below the maximum allowable values?	*Yes/No	*Yes/No
3.6	<u>Inspection for Hazard Precaution and Fire Prevention</u>		
3.6.1	Inspection for Electrical and Electrostatic Hazard Precaution		
3.6.1.1.	Are all electrical equipment in the designated hazardous area comply with the recommendations of the relevant British Standard Specification?	*Yes/No	*Yes/No
3.6.1.2.	Are all the LPG piping and equipment electrically continuous and earthed, except where breaking in continuity is necessary for cathodic protection requirements?	*Yes/No	*Yes/No
3.6.1.3.	Is it true that the LPG piping has not been used as electrical circuit protective conductor or earth electrode for the other system, though their bonding to the circuit protective conductor may be necessary?	*Yes/No	*Yes/No
3.6.2	Inspection for Fire Prevention		
3.6.2.1.	Have all fire fighting systems and facilities required by Fire Services Department been provided for the LPG storage compounds/cabinets?	*Yes/No	*Yes/No
3.6.2.2.	Have all warning signs/emergency notices been painted or fixed in appropriate locations as required by Fire Services Department and COP for Hong Kong LPG Industry Module 1?	*Yes/No	*Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Appendix A

		Items tested checked by <u>Contractor</u>	Items witnessed by <u>*PBSE/*PBSI</u>
3.6.2.3.	Have weeds, long grass and any combustibile material been kept clear from an area as specified by the LPGGS?	*Yes/No	*Yes/No
3.6.2.4.	Is the mechanical ventilation system associated with the LPG installation in proper working order?	*Yes/No	*Yes/No
3.6.3	Ventilation		
3.6.3.1	Is all mechanical ventilation system associated with LPG installation in proper operation?	*Yes/No	*Yes/No
3.7	<u>Functional Test</u>		
3.7.1	Is LPG available when gas equipment is connected?	*Yes/No	*Yes/No
3.8	<u>Performance Test</u>		
3.8.1	Is gas distribution system operating within correct pressure regime?	*Yes/No	*Yes/No
3.8.2	Is vaporiser in satisfactory operation and with correct power input (heat input)?	*Yes/No	*Yes/No
3.8.3	Is adequate gas flow provided for the gas equipment?	*Yes/No	*Yes/No
3.9	<u>Comments</u>	*Yes/No	*Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Part 4. Test Record attached to the Test Certificate

4.1 Pressure test of pipework before treated, concealed or buried

Date of test	Section of pipework	Pressure stage	Working pressure (kPa)	Testing Pressure (kPa)	Duration of testing	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.2 Pressure test of pipework on completion

Date of test	Section of pipework	Pressure stage	Working pressure (kPa)	Testing Pressure (kPa)	Duration of testing	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.3

Function test on valves

(including isolation valves, quick-action valves, shut-off valves, check valves, etc.)

Date of test	Valve ref. no.	Type of valve	Pressure stage	Working pressure (kPa)	Testing Pressure (kPa)	Duration of testing	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.4

Function test on pressure regulation devices

(+for shut-off function of monitoring regulators, pressure relief function of internal pressure relief valves of regulators and governors, etc.)

Date of test	Device ref. no.	Type of Device	Pressure stage	Upstream pressure (kPa)	Downstream Pressure (kPa)	Actuating pressure +(kPa)	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.5 Test on electrical continuity of LPG installation

Date of test	Points of measurement		Resistance measured ?	Remarks
	From	To		

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

4.6 Test on earthing system

Date of test	Points of measurement		Resistance measured ?	Remarks
	From	To		

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.7 Insulation test on electrical installation

Date of test	Circuit/ device tested	Resistance measured ?	Remarks

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

4.8 Test certification for pipework

Location and address of installation :

This is to certify that all liquefied petroleum gas pipework installed at the above premises is constructed of suitable material and has been pressure tested in accordance with Fire Services Department's requirements. All buried pipework has been adequately protected against corrosion in accordance with the specifications. The testing and corrosion proof coating have been witnessed by the undersigned on _____ .

Details of piping materials and tests are as follows :-

Section of Pipe	All Liquid Lines	All High Pressure Vapour Lines before First Stage Regulating System	All Medium Pressure Vapour Line	All Low Pressure Vapour Line
Pipeline Specification & Schedule				
Fitting Specification & Schedule				
Valve Material and Rating				
Testing Medium				
Working Pressure (kPa)				
Test Pressure (kPa)				
Duration of Test (Hr)				

Remarks :

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

4.9 Test certification for *pressure relief valves/hydrostatic relief valves

This is to certify that the following *pressure relief valve(s)/and hydrostatic relief valve(s) *has/have been pressure tested and sealed :-

Date of test	Valve ref. no.	Type of valve	Made/ model no.	Pressure stage	Working pressure (kPa)	Agiotage pressure (kPa)	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.10 Test certification for excess flow valves

This is to certify that the following excess flow valve(s) *has/have been pressure tested :-

Date of test	Valve ref. no.	Made/model no.	Pressure stage	Working pressure (kPa)	Design flow rate (l/s)	Actuating flow rate (l/s)	Test result

Tested / Checked by _____ Signature _____
 (Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
 (Name of Competent Person)

Witnessed by _____ Signature(s) _____
 (Name(s) of *PBSE/*PBSI)

4.11 Test certification for pressure gauges

This is to certify that the following pressure gauges(s) *has/have been tested and results are as indicated :-

Date of test	Gauge ref. no.	Made/ model no.	Pressure range (kPa)		Tolerance	Remarks
			From	To		

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

4.12 Test certification for LPG storage facilities

4.12.1 Bulk LPG Storage System

Type of Test	Date of Test	Summary of Result and Observation	Test Certificate Attached
Test on internal flaw			* Yes/No
Ultrasonic/radiographic test			* Yes/No
Test on external flaw			* Yes/No
Magnetic particle test			* Yes/No
Penetration test			* Yes/No
Hydraulic test			* Yes/No
Pneumatic test			* Yes/No
Holiday test			* Yes/No
Leak test			* Yes/No
Paint thickness test			* Yes/No
Cathodic protection test			* Yes/No

4.12.2 LPG Cylinder

a. Type approval of gas container by Gas Authority attached * Yes/No

4.12.3 Approval of use before LPG filling

a. Approval of us by Gas Authority attached * Yes/No

Tested / Checked by _____ Signature _____
(Name of Contractor's Representative)

Certified by Competent Person _____ Signature _____
(Name of Competent Person)

Witnessed by _____ Signature(s) _____
(Name(s) of *PBSE/*PBSI)

Testing and commissioning progress chart “Liquefied Petroleum Gas Installation”

Contract No. : _____

Contract Title : _____

Name of Liquefied Petroleum Gas Contractor/sub-contractor : _____

Contract Period : ___ / ___ /20___ to ___ / ___ /20___ * Revised/Actual Completion Date : ___ / ___ /20___

Testing and Commissioning Progress Chart for Liquefied Petroleum Gas Installation (Rev. ___) (1)												Remark					
Dates (2)																	
Activities	Reference to Approved T&C Procedure	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A
1.	Piping System Visual inspection	Section 3.1															
	G/F																
	1/F																
	2/F																
	3/F																
	4/F																
	Submission of Record of Test																
2.	Bulk LPG Storage System Visual inspection	Section 3.2															
	G/F																
	1/F																
	2/F																
	3/F																
	4/F																
	Submission of Record of Test																
3.	LPG Cylinder Storage System Visual inspection	Section 3.3															
	G/F																
	1/F																
	2/F																
	3/F																
	4/F																
	5/F																
	Submission of Record of Test																

Testing and Commissioning Progress Chart “Liquefied Petroleum Gas Installation”

Testing and Commissioning Progress Chart for Liquefied Petroleum Gas Installation (Rev.) ⁽¹⁾		Dates ⁽²⁾																Remark	
	Activities	Reference to Approved T&C Procedure	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	
4.	Vaporizers/accessories	Section 3.4																	
	Visual inspection																		
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	Submission of Record of Test																		
5.	LPG Appliances	Section 3.5																	
	Visual inspection																		
	G/F																		
	1/F																		
	2/F																		
	3/F																		
	4/F																		
	Submission of Record of Test																		
6.	Hazard Precaution and Fire Prevention	Section 3.6																	
	Visual inspection																		
	Submission of Record of Test																		
7.	Functional Test	Section 3.7																	
8.	Performance Test	Section 3.8																	
9.	Submission of T&C Certificate																		

Notes

- * Delete as if not applicable
- (1) Insert revision no.
- (2) Insert additional columns as necessary
- S - schedule % completion
- A - actual % completion

Testing and Examination of LPG Tank**Under Regulation 8 of Gas Safety (Gas Supply) Regulations, Cap.51**GasSO Ref:

To : The Gas Authority

Address of Notifiable Gas Installation :

Mode of Storage, Serial No., Water Capacity & Vessel Design Code :

Date of Installation & Last Revalidation :

I certify that the above vessel has satisfactorily been tested and examined under my supervision in accordance with the Gas Standards office's requirements in order to comply with Regulation 8 of the Gas Safety (Gas Supply) Regulations and it is suitable for LPG service:-

Test/Examination	Test Dates(s)	Attached Document Reference No.	Tested by	Remarks
Full visual examination &				
Ultrasonic thickness test				
Magnetic particle test				
Paint thickness & holiday tests				
Testing & examination of vessel fittings				
Cathodic protection test				
Electrical continuity test				

Certified by
Competent Person :

Company Chop :

Signature :

Company Name :

Date:

Testing and Examination of LPG Vaporiser

Under Part IV Gas Safety (Gas Supply) Regulations, Cap. 51

GasSO Ref:

To : The Gas Authority

Address of Notifiable Gas Installation :

I certify that the LPG vaporiser(s) installed at the above permit has satisfactorily been tested and examined under my supervision in accordance with the Gas Standards Office's requirements in order to comply with Part IV of the Gas Safety (Gas Supply) Regulations. The test and examination was carried out by :-

of

on

Details of vaporiser(s) and test are as follows:-

	(1)	(2)	(3)
Make & Model			
Serial Number			
Date of Manufacture			
Vaporising Capacity (kg/hr)			
Pressure Vessel Code			
Test Pressure (kPa)			
Duration of Test (Hr)			
Pressure Relief Valve			
Overall Condition			

Certified by
Competent Person :

Company Chop :

Signature :

Company Name :

Date :

Testing and Examination of LPG Pipes

Under Part V of Gas Safety (Gas Supply) Regulations, Cap.51

GasSO Ref:

To : The Gas Authority

Address of Notifiable Gas Installation :

I certify that all liquefied petroleum gas pipework installed at the above permit is constructed of suitable materials and has been tested/examined in accordance with the Gas Standards Office's requirements. All pipework has been adequately protected against corrosion in accordance with the specifications. The test/examination was carried out by

of

on

Details of pipework materials and tests are as follows :-

Section of Pipework	All liquid Lines	All High Pressure Vapour Lines before First Stage Regulating System	All Medium Pressure Vapour Lines	All Low Pressure Vapour Lines
Pipeline specification & schedule				
Fitting specification & schedule				
Valve material and rating				
Testing medium				
Working pressure (kPa)				
Test pressure (kPa)				
Duration of test (Hr)				
Pressure setting of Hydrostatic Pressure Relief Valve (kPa)		N/A	N/A	N/A

Remarks : Pressure drop observed? Yes/No.

If 'Yes', please specify causes and remedial actions:-

Certified by
Competent Person :

Company Chop :

Signature :

Company Name :

Date :