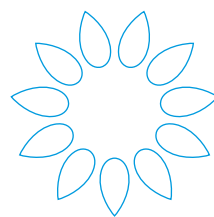




**HANDBOOK ON DESIGN,
OPERATION AND
MAINTENANCE OF**

GAS UTILISATION FACILITIES





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- Sinopec (Hong Kong) Petroleum Holding Company Limited
- The Hong Kong and China Gas Company Limited

TERMS AND ABBREVIATIONS

EMSD	Electrical and Mechanical Services Department
Government	The Government of the Hong Kong Special Administrative Region of the People's Republic of China
LPG	Liquefied Petroleum Gas
RGC	Registered Gas Contractor
RGSC	Registered Gas Supply Company

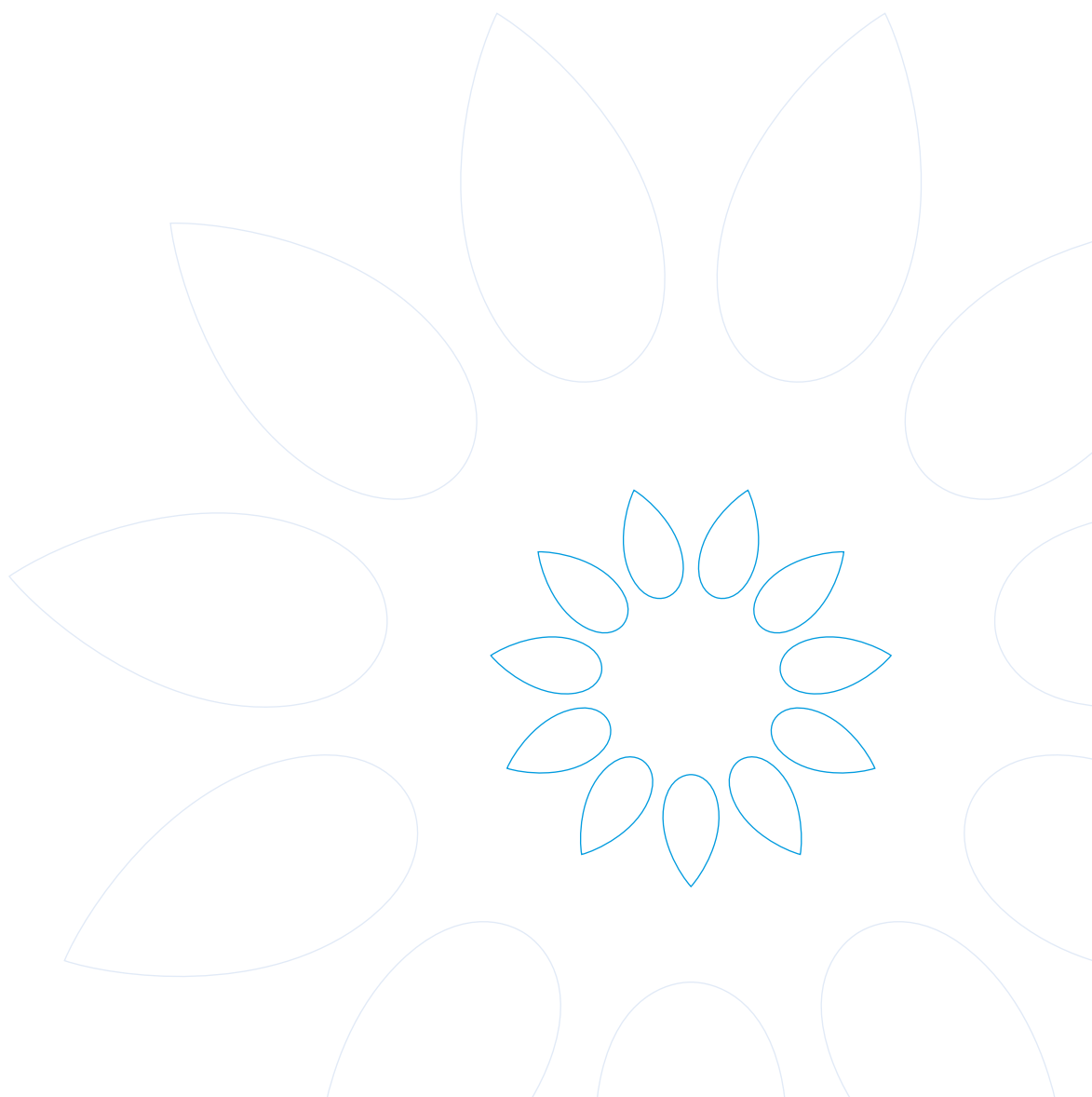




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1 INTRODUCTION

1.1 About This Handbook

- (1) This Handbook recommends good system design and operational practices in principle for town gas installation and Liquefied Petroleum Gas (LPG) installation in commercial kitchens. Similar concepts also apply to domestic kitchens.
- (2) This Handbook covers “General Practice” and “Best Practice” associated with the design consideration, operation and maintenance of gas installations in commercial kitchens. “General Practice” refers to general requirements in fulfilling statutory requirements and guidelines as well as aligning common practices in the trade. Whilst “Best Practice” helps to further enhance the safety performance of gas installations by considering exemplary practices and innovative technologies identified at the time of preparation and revision of this Handbook.
- (3) This Handbook also introduces to readers the application of smart meters and gas detectors for gas installations in kitchens. Application of these safety devices can enhance operational safety of gas installations. They may also be installed at other areas with gas installations such as pipe ducts, food factories, laundries, etc.

1.2 Target Audience

- (1) The target audience of this Handbook is primarily trade operators including Registered Gas Supply Companies (RGSC), Registered Gas Contractors (RGC), Registered Gas Installers, LPG distributors, etc.
- (2) In daily operation, gas safety relies on the daily practices of restaurant owners and kitchen operators, and trade operators may be consulted by their customers regarding gas safety and technical advices. In this regard, information and recommendations in the interest of the owners and responsible persons of catering premises (hereinafter called “owners”) using gas fuel, as well as staff of management office who may have to deal with catering tenants consuming gas, are also given in this Handbook as reference.

1.3 Related Ordinances, Regulations and Guidelines

- (1) Requirements for other gas installations, such as domestic gas water heaters and ventilation systems, and other gas safety measures are given in the undernoted ordinances, regulations and codes of practice, etc. Readers may refer to these documents for further information:-
- a) Gas Safety Ordinance (Cap.51)
 - b) Gas Safety (Gas Supply) Regulations (Cap.51B)
 - c) Gas Safety (Installation and Use) Regulations (Cap.51C)
 - d) Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations (Cap.51D)
 - e) Gas Safety (Registration of Gas Supply Companies) Regulations (Cap.51E)
 - f) Gas Safety (Miscellaneous) Regulations (Cap.51F)
 - g) Code of Practice GU01 – Approval of Flexible Gas Tubing for Low Pressure Applications
 - h) Code of Practice GU03 – Installation Requirements for Domestic Gas Water Heaters (Rated Heat Input up to 70kW)
 - i) Code of Practice GU05 – Approval of Domestic Gas Appliances
 - j) Code of Practice GU06 – LPG Installations for Catering Purposes in Commercial Premises
 - k) Code of Practice GU09 – Low Pressure Regulators for Supplying Gas from LPG Cylinders having less than 40 litres Water Capacity
 - l) Code of Practice GU12 – Installation of Mechanical Exhaust System for Gas Appliances (Rated Heat Input up to 70kW)
 - m) Code of Practice GU14 – Enclosed Type of Gas-fired Meat Roaster
 - n) Code of Practice GU15 – Flexible Gas Tubing for Commercial Applications (Not Including Flexible Gas Tubing for Low Pressure Applications)
 - o) Guidance Note GU16 - Medium Pressure LPG Gas Appliances
 - p) Code of Practice GU21 – Requirements for Town Gas Installations for Catering Purposes in Restaurants and Food Preparation Establishments
 - q) The Hong Kong & China Gas Co. Ltd.'s Operating Procedures – Service



2 DESIGN CONSIDERATIONS

2.1 Gas Supply Systems

2.1.1 General Practice

- (1) The owner has the responsibility to ensure that gas installations in the kitchen comply with the Gas Safety Ordinance (Cap.51) and follow the Guidance Notes and Codes of Practice issued by the Gas Authority.
- (2) For kitchens with gas supply using LPG cylinders, the following requirements should always be adhered to:
 - a) LPG cylinders should be stored inside a LPG cylinder chamber while LPG cartridges should be stored in a LPG storage chamber. The location and design requirements of the LPG cylinder chamber and LPG storage chamber are listed in the Code of Practice **“GU06 LPG Installations for Catering Purposes in Commercial Premises”**. The total aggregated water capacity of LPG cylinders and cartridges (including empty ones) must not exceed 130 litres, otherwise they are defined as Notifiable Gas Installations (NGI) for which the owner shall submit an application to the Gas Authority. A typical LPG cylinder storage chamber is shown in **Figure 1**.

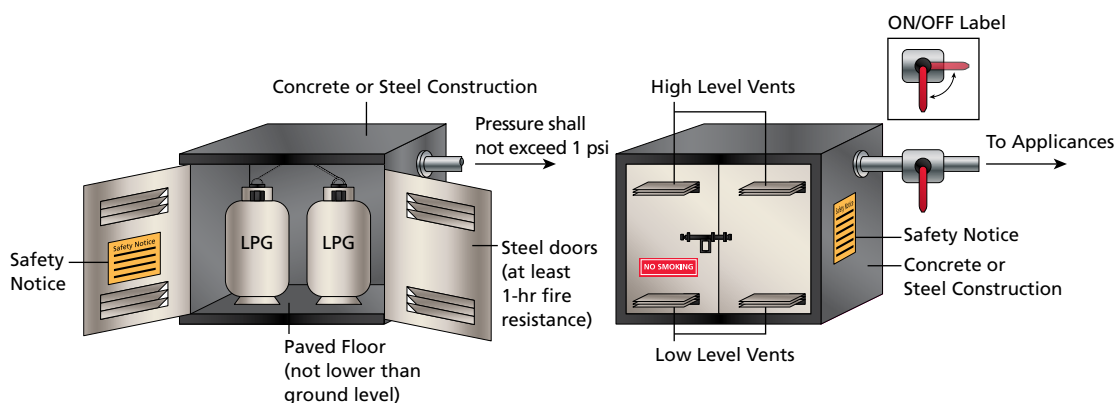


Figure 1: Typical LPG Cylinder Storage Chamber Arrangement

- b) A main isolation valve should be installed immediately outside the LPG cylinder chamber. It should be labelled clearly in both Chinese and English for easy identification.
- c) Each RGSC has a list of approved LPG cylinder distributors. The owner should only purchase LPG in cylinder container from a distributor on the list. The full list of approved LPG cylinder distributors can be found on the EMSD website.
- d) Unless the catering premises is registered as a NGI with approval from the Gas Authority, the owner should not store LPG cylinders and LPG cartridges (including empty cylinder/cartridge) of more than 130 litres aggregated water capacity (approximately 50 kg) inside the premises.

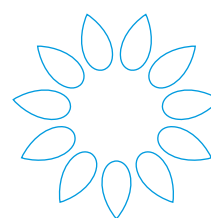
- (3) Since a gas appliance would generate flue gas and air contaminants, the owner should install a ventilation system with adequate flowrate to extract them from the kitchen. A system interlocking the ventilation system and the gas supply system should also be installed for the sake of gas safety. An interlock device is to ensure that gas supply is activated only when the ventilation system functions properly. Reference can be made to the Code of Practice **“GU12 Installation of Mechanical Exhaust System for Gas Appliances (Rated Heat Input up to 70 kW)”**.
- (4) On some occasions, cassette cookers may be used for keeping the temperature of food or for hotpots. The owner should only select a cassette cooker bearing a “GU” mark from the list of domestic gas appliances approved by the Gas Authority. The list can be found on the EMSD website. The “GU” mark label is illustrated in **Figure 2**.
- (5) Newly designed gas appliances are equipped with automatic ignitors and Flame Failure Devices (FFD) to enhance safety. The owner should consider choosing gas appliances with these devices in the first place to protect people and properties.
- (6) For the connection between gas pipe/cylinder and gas appliances, flexible tubing may be an option. The owner should only choose flexible tubing approved by the Gas Authority. The list can be found on the EMSD website. A typical flexible gas tubing is shown in **Figure 3**.



Figure 2: GU Mark Label for Domestic Gas Appliances Approved by the Gas Authority



Figure 3: Flexible Gas Tubing Approved by the Gas Authority



2.1.2 Best Practice

- (1) The owner should only consider using LPG supplied from a cylinder as cooking fuel when town gas or piped LPG supply is not available.
- (2) Since a rubber gas tubing has a relatively short service life and is vulnerable to physical damage, it is recommended to replace it with metallic flexible gas tubing, i.e., corrugated stainless steel tube which has a much longer lifespan and is more durable than rubber tubing.
- (3) Gas appliances should not be installed in contact with any combustible wall or floor surfaces. For commercial gas appliances, their heating capacity is much larger than that of domestic gas appliances. A minimum separation distance of 150mm (6 inches) should be allowed between the combustible wall and the commercial gas appliance. Where it is not possible to achieve this separation distance, shielding with non-combustible material is necessary if temperature in excess of 65°C is likely to be experienced in the vicinity of the gas appliance.
- (4) For better identification of gas pipes, the following recommendations should be considered:
 - a) The catering premises owner is recommended to request a record of the gas pipe alignment in the form of a layout plan from the RGC. The plan can facilitate future modification and premises renovation work, and reduce the chance of damage to gas pipe.
 - b) Apart from fire services pipes, other pipes in a building for gas supply, water supply, drainage services and air conditioning systems do not have a designated colour for identification. The external colours of these various pipes are sometimes similar or even identical in order to harmonise with the colour scheme of the building façade or internal finishes, thus causing confusion. Although there are labels affixed on gas pipes at certain intervals for distinction, damage on gas pipes still occurs occasionally due to misidentification.
 - c) In addition to affixing gas labels at conspicuous locations along a gas pipe, applying distinct colours for the gas pipes can also be adopted for easy identification.
 - d) If application of distinct colours for gas pipes is impracticable due to design/architectural aesthetics reasons, the distances among gas labels affixed to pipe surfaces should be shortened to increase their visibility to workers and occupiers.
- (5) Although town gas/LPG has a distinctive smell, leakage of gas may not be noticed during non-business hours. It is recommended that a gas detector complete with alarm/gas suspension devices, which would be more sensitive, should be installed in the kitchen. More details about gas detectors are given in Section 2.4.

2.2 Gas Meters

2.2.1 General Practice

- (1) Gas meters shall not be installed in any common area of any premises which has more than one occupier where that area is designated as the only means of escape from the premises in case of fire or in protected lobbies. For meters installed at such locations prior to 1 April 1991, future replacements shall be in accordance with Regulation 10(1) of the Gas Safety (Installation and Use) Regulations, Cap.51C.
- (2) Primary gas meters shall be installed as close as practicable to the point of service entry into the premises and be suitably labelled in accordance with Regulation 13 of the Gas Safety (Installation and Use) Regulations, Cap.51C.

2.2.2 Best Practice

- (1) Smart gas meter have been used in selected developments as a trial. The use of smart gas meter should be adopted progressively with the maturity of the technology. More details about smart gas meter are given in Section 2.4.

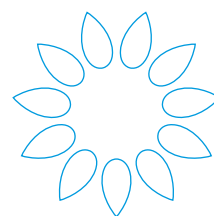
2.3 Emergency Control Valves and Fire Safety Valves

2.3.1 General Practice

- (1) An emergency control valve shall be installed, so far as practicable, near the point of gas service entry into the premises in an accessible location for use by the kitchen/premises users in an emergency. The construction, location and labelling of the emergency control valve shall be in accordance with Regulation 8 of the Gas Safety (Installation and Use) Regulations, Cap.51C.
- (2) A fire safety valve shall be located external to the kitchen area for use by Fire Services Officers in an emergency. The valve shall be located in an accessible position and be labelled. For further information about the position of fire safety valves, please refer to the Code of Practice **“GU21 Requirements for Town Gas Installations for Catering Purposes in Restaurants and Food Preparation Establishments”**.

2.3.2 Best Practice

- (1) An emergency control valve should not be installed in a false ceiling. It should be installed at a location that is easily visible and readily accessible to gas users without having to use any hand tools.



2.4 Application of Technology

2.4.1 Best Practice

Smart Gas Meter

- (1) A smart gas meter enables a gas user to monitor the status of a gas supply system any time. It may send information such as instantaneous gas consumption to a user and the RGSC upon request or at preset intervals. It reduces the inconvenience caused to the gas user by eliminating the need for in-situ metre-reading visits by the RGSC's personnel and the hassle of making such appointments.
- (2) Besides, a smart gas meter with internal valve can serve as a safety device. It can send alert signals to users and/or the RGSC to take corrective action when a faulty symptom is detected, and automatically suspend gas supply to the premises in case of gas leakage.

Exemplary Applications

- (3) A RGSC has developed smart gas meters (**Figure 4**) which have been installed in a new residential development as a pilot project. The installed smart gas meters can automatically suspend gas supply in case of gas leakage.



Figure 4: Smart Gas Meter installed in a Kitchen of a Local Domestic Premises

- (4) The RGSC is advancing the technology so that the next generation of meters can communicate with mobile phones (**Figure 5**) and have the following functions:
 - a) Suspend gas supply if there is a sudden increase in gas consumption rate (excess flow). The meter will send a signal to the RGSC for immediate action;
 - b) Send a signal to the RGSC if the meter detects continuous flow for an exceptionally long period of time;
 - c) Send a signal to the RGSC reminding it to take follow-up actions if regular safety inspection of gas installations in the premises has not been conducted for a long period of time;
 - d) Transmit the record of gas consumption to the RGSC automatically; and
 - e) Send information such as payment and meter status to mobile devices.



Figure 5: New Generation of Gas Meters developed by a RGSC

- (5) Smart gas meters are also available for commercial kitchens, apart from those for domestic kitchens. The handling capacity of these meters is larger than that for domestic kitchens. Besides, their size and appearance (**Figure 6**) are significantly different from domestic smart gas meters.
- (6) Smart meter technology is still undergoing further development, and more functions may be incorporated into novel smart gas meters over time.



Figure 6: Smart Gas Meter for Commercial Kitchens / Industrial use

Recommendations

- (7) Gas meters are normally owned and maintained by the RGSC. Therefore, any owner/occupant who wants to install a smart gas meter should liaise with the RGSC to obtain mutual agreement for installing smart gas meters.
- (8) Installation of a gas meter is gas installation work, as defined in the Gas Safety (Registration of Gas Installers and Gas Contractors) Regulations. The work shall therefore be carried out by a RGC.
- (9) Each smart gas meter is designed for a specific range of working pressure and flowrate. For instance, a smart gas meter for residential use may not be applicable to commercial/industrial use. Therefore, a RGC should ensure that the operating conditions of the gas supply network, where the smart gas meter is to be installed, match with the design conditions and specifications of the meter.

Gas Detectors

- (10) Gas detectors can be installed at areas with potential risk of accumulation of gaseous substances. When gas leakage is detected, the gas detector can actuate a gas control system to suspend gas supply to the premises. The schematic of a typical gas detection system in a commercial kitchen is shown in **Figure 7**.

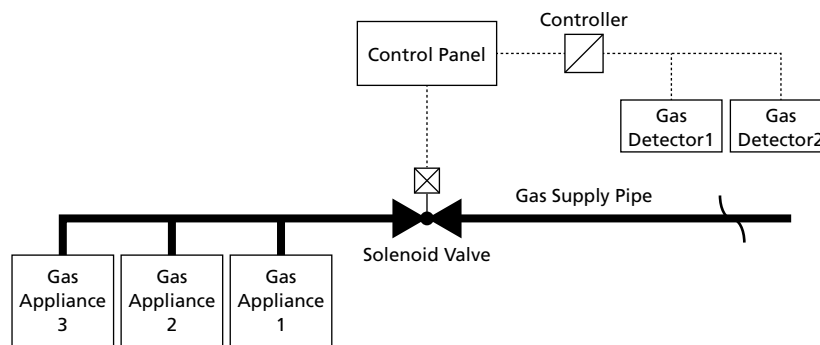


Figure 7: Schematic of a Typical Gas Detection System in Commercial Kitchens

(11) The heating capacity of gas appliances in a commercial kitchen is much larger than that of those in a domestic kitchen. As such, the gas consumption rate and amount of emitted gaseous by-products in a commercial kitchen will be more vigorous than those in a domestic one. Apart from installing interlock system between the ventilation fan and the gas supply system as stipulated in the **“Code of Practice GU21 – Requirements for Town Gas Installations for Catering Purposes in Restaurants and Food Preparation Establishment”**, installing gas detectors can further enhance gas safety if the detectors are properly maintained.

Proper Maintenance of Gas Detectors

(12) The application of gas detectors is stipulated in the **“Code for Design of City Gas Engineering, GB 50028-2006”** as China’s national standard. The environment of a kitchen is normally filled with mist and oily airborne particulates which may be detrimental to gas detectors. After years of application of gas detectors, the trade has reported certain facts that are beyond controversy:

- a) The lifespan of a detecting section is around 2 to 3 years.
- b) Annual calibration of the detector is essential.
- c) Proper maintenance is required to avoid false alarms.

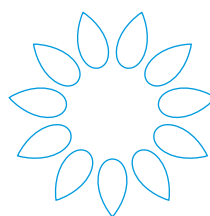
(13) Therefore, regular checks and proper maintenance of the detectors are essential to keep the entire detection system in working order.

Recommendations

(14) A gas detector should be selected according to the type of gas (e.g., town gas or LPG) in use and installed at a suitable height. **Table 1** provides a guide for the installation of a gas detector.

Gas in Use	Weight Compared with Air	Installation Level of Gas Detector	Gaseous Substances to be Monitored	Other Monitoring Parameters
Town Gas	Lighter	Ceiling level	Methane, CO, CO ₂	Lower Explosion Limit
LPG	Heavier	Floor level	Propane, butane, CO ₂	Lower Explosion Limit

Table 1: Installation Guide for Gas Detectors



- (15) According to the Practice Note for Authorised Persons, Registered Structural Engineers and Registered Geotechnical Engineers (PNAP) ADM-2 issued by the Buildings Department, fresh air supply at kitchens in non-domestic buildings shall be **20 air changes per hour** by which combustion products should be able to be effectively extracted from the kitchen.
- (16) Adequate ventilation must be available to ensure ready supply of fresh air for combustion and safe removal of combustion products in accordance with Regulation 23(1) of the Gas Safety (Installation and User) Regulations, Cap.51C. For those catering installations where natural ventilation is not sufficient or not available, mechanical ventilation shall be employed. A reliable means such as interlock system shall be provided to ensure that the mechanical exhaust system is always in operation when gas appliances are in use in accordance with Regulation 24(4) of the Gas Safety (Installation and User) Regulations, Cap.51C.
- (17) To meet the above-mentioned requirements, a ventilation interlock system is essential to safeguard gas and occupational safety in a kitchen while a gas detection system can help prevent gas leakage.
- (18) The gas detector should be properly maintained to ensure its accuracy and avoid false alarms. The owner and operator of the gas detector are both accountable for ensuring proper maintenance of the gas detector.



3 OPERATION AND MAINTENANCE



3.1 Daily Operation

3.1.1 General Practice

- (1) A gas user's awareness constitutes a key element of upholding gas safety in the kitchen. The following practices should be adopted in the daily operation of a commercial kitchen:
 - a) Kitchen staff should visually check the operating conditions of the gas appliances to ensure that they are in good working order.
 - b) The main isolation valve of a gas supply system should be turned off at close of daily business, after ensuring that all gas appliances have been switched off properly.
 - c) Prior to commencement of daily operation, kitchen staff should check if all gas appliances had been turned off properly before the opening of the main isolation valve, and thereafter, check if there is any gas leakage or town gas/LPG distinctive smell before using any electrical or gas appliances.
 - d) In case of suspected gas leakage, kitchen staff should stay calm and leave the kitchen after closing the gas main isolation valve. Once in a safe place, the staff should contact a RGC to arrange for repair work. If the leakage is uncontrollable, the staff should leave the kitchen immediately and dial the 999 emergency hotline.
 - e) A gas supply pipe is not designed to withstand external loading other than that of the gas supply system itself. As such, the pipe should not be used to support other objects or as a hanger. Besides, the gas pipe should be well protected from chemical attacks such as detergents and other cleaning agents.
 - f) Both town gas and LPG require fresh air for combustion. Therefore, an oversized pot placed on a cooktop may obstruct the supply of fresh air to the burner, thus affecting its burning efficiency. In addition, it may block the chef's line of sight in inspecting the flame condition. Pots should be of an appropriate size.
 - g) LPG cylinders should be kept inside a cylinder chamber. A person with adequate hands-on experience may replace the cylinder of a gas appliance by himself/herself. After replacement of the cylinder, he/she should check the integrity of the supply connection to ensure gas tightness and arrange the LPG cylinder distributor to collect the used cylinder as soon as practicable.
- (2) Any person, unless he/she is a RGI of an appropriate class employed by a RGC, should not repair the gas appliance on his/her own or disable the associated safety device of the gas appliance in order to enable its temporary operation. Instead, he/she should request a RGC to arrange for a RGI of an appropriate class to carry out the inspection and repair work.

3.1.2 Best Practice

Phasing out of Rubber Gas Tubing

- (1) Flexible gas tubing is a gas fitting used to connect a gas appliance like cooker or clothes dryer to the gas supply point in a domestic gas installation. It may also be used at other places like restaurants. Normally a tubing bearing the approval mark of the Gas Authority indicates a manufacture date and, depending on the type, can be used for 3 to 10 years from its manufacture date. There are currently 3 types of flexible gas tubing as follows:
 - a) Type 1 – Tubing made of rubber
 - b) Type 2 – Tubing made of rubber with stainless steel braiding or amouring
 - c) Type 3 – Tubing made of stainless steel with stainless steel braiding or amouring
- (2) Types 1 and 2 flexible tubing are made of rubber which deteriorates with aging as a result of various factors including ambient temperature, light, oxygen, etc. As such, there is an expiry date for types 1 and 2 tubing. While type 3 tubing is made of stainless steel, it does not have such a problem. In addition, type 3 tubing can withstand a higher degree of physical attack as compared with the other types and therefore does not have any expiry date.
- (3) The gas user/RGC should select type 3 flexible tube as the first priority, where possible, for a new installation or replacement of type 1 or 2 flexible tubing. In this regard, a major RGSC has already been using type 3 stainless steel tubing for their appliances.

Identification of Live Gas Supply Pipes from Abandoned Pipes

- (1) In some buildings (normally commercial buildings), service laterals are branched off from a gas riser on each floor. An isolation valve may be installed at the immediate junction of each branch. At the service lateral inside individual premises, there is also a gas meter control valve. A schematic of the pipe network is shown in **Figure 8**.

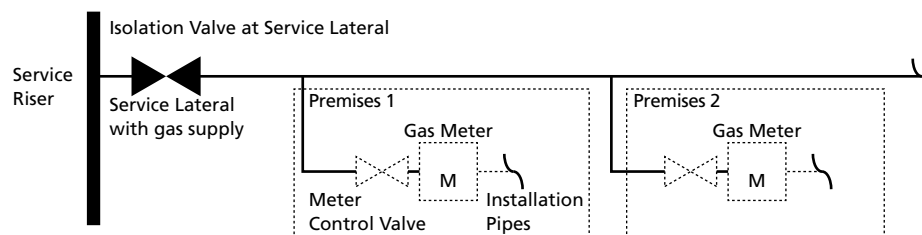


Figure 8: Pipe Schematic of a Typical Commercial Building

- (2) When a premises does not require gas supply, the owner may inform the RGSC to terminate the gas supply and arrange demolition of the gas pipes. In the past, there were cases where the RGSC only closed and locked the meter control valve while leaving the isolation valve opened. The gas pipe section upstream of the meter control valve was therefore still supplied with gas.
- (3) An example is illustrated in **Figure 9**. The gas pipe sections including a service lateral and the isolation valve located inside the premises were still supplied with gas (live gas pipe section). The RGSC would affix a caution label marked with “Live Gas Pipe 帶氣喉管” next to the isolation valve inside the premises. However, a renovation worker who found that the gas supply to the installation pipe was suspended would perceive that the caution label was no longer valid. Eventually, the live gas pipe section was damaged by the worker, leading to a gas escape incident.

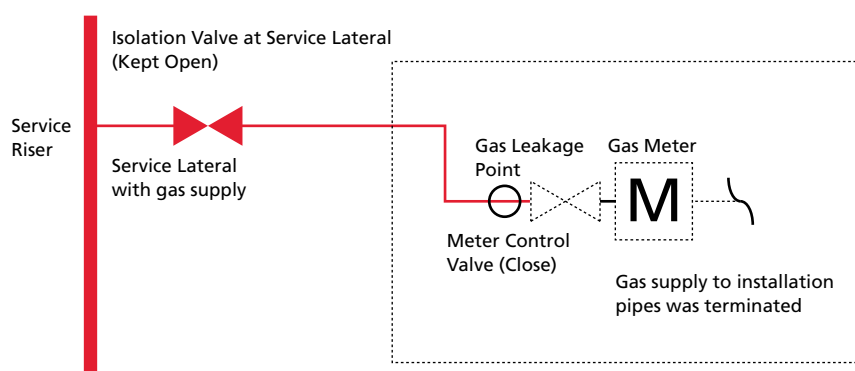


Figure 9: Example of a Third party Damage on a Live Gas Pipe

- (4) To avoid recurrence of similar incidents, the RGSC should adopt the following measures at the time of terminating gas supply to a premises:
- For premises in which there is another isolation valve upstream of the meter control valve, the RGSC should inform the building management office as they may need to consult the related parties about the gas supply status at the premises;
 - Apart from the meter control valve, the RGSC should also close the isolation valve at the service lateral if it only serves the subject premises;
 - The RGSC should affix a caution label marked with “Live Gas Pipe 帶氣喉管” close to the meter control valve. The same caution label should also be affixed, at certain intervals (e.g., within 1m), along the live pipe sections. Besides, the label should bear a date with font size large enough for ease of inspection;
 - The RGSC should check and ensure that the gas pipe identification tapes on the live pipe sections are still intact, clear and sufficient to serve their purpose of notification;
 - The RGSC should take photos of the live pipe sections as well as the locations of the “Live Gas Pipe 帶氣喉管” caution labels and gas pipe identification tapes for record.

Isolating Abandoned Gas Pipes at Demolition Sites

- (1) Damage of abandoned gas pipes at demolition sites leading to gas incident was occasionally reported. Typically, the isolation valve at the underground pipe section was closed and the majority of the exposed gas pipes inside the building to be demolished were removed. However, part of the pipe section immediately connected to the isolation valve had sometimes remained intact, only with its end plugged (**Figure 10**).

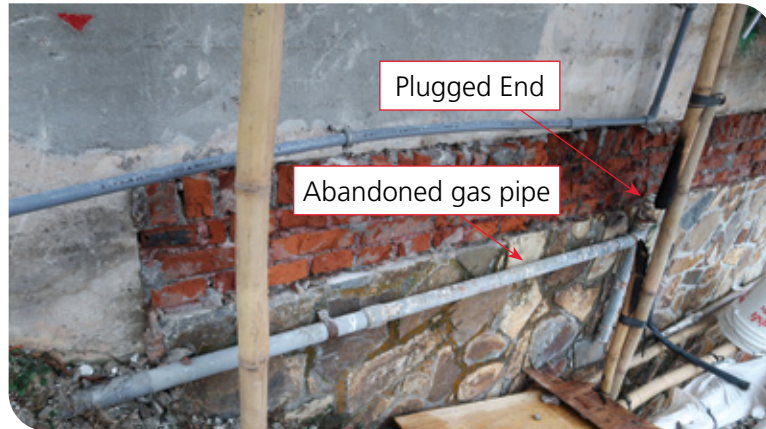


Figure 10: Example of a Third party Damage on a Live Gas Pipe

- (2) There was a preceding case where an abandoned pipe section between the isolation valve and the plugged end was still filled with residual gas which eventually leaked out from the pipe when a demolition worker cut on it. To avoid recurrence of similar incidents, the RGSC/RGC should adopt the following measures:

Isolation of Gas Pipes from Gas Supply by RGSC/RGC

- a) Prior to termination of gas supply to the site, the RGSC/RGC should mutually agree with the project proponent for the disconnection point at the gas pipe;
- b) The disconnection point at the gas pipe should be so selected that the retained pipe section will not have physical contact with any structure which is to be demolished or will be left unsupported after demolition of the building structures;
- c) The residual gas contained inside the pipe section between the isolation valve and the plug-off end should be thoroughly purged;
- d) The retained pipe section should be fixed with a warning notice at a conspicuous location and with sufficient font size for easy visualisation. The contact phone number of the RGSC/RGC should be displayed on the warning notice for enquiries, if any;
- e) The RGSC/RGC should take photos of the warning notice and precautionary measures implemented for the abandoned gas pipe, for record.



Demolition of Abandoned Gas Pipelines

- a) A demolition contractor should pay particular attention to a gas pipe, which is going to be demolished, if it is plugged at one end while embedded in wall or ground (**Figure 10**) at the other end. For this situation, the subject pipe may still be connected to a gas supply network. Demolition of the pipe may consequently damage the integrity of the entire pipe section, which is still supplied with gas or filled up with residual gas, leading to gas leakage.
- b) Prior to commencement of the gas pipe removal work, the demolition contractor should ensure that the abandoned gas pipe has already been disconnected from a live gas pipe/fitting. If, under any circumstances, the demolition contractor is unable to confirm the gas supply status of a pipe section, the RGSC/RGC concerned should be consulted before commencement of the demolition work.
- c) In case a gas pipeline section to be demolished is found connected to a live gas pipe, a RGSC/RGC should be engaged to disconnect it from the live gas pipe section, according to the measures described in the "Isolation of Gas Pipe from Gas Supply by RGSC/RGC" section above.

3.2 Emergency Preparedness

3.2.1 General Practice

Affixing Emergency Notices at Conspicuous Locations

- (1) An ON/OFF notice in permanent form, in English and Chinese (**Figure 11**), shall be affixed adjacent to a gas emergency control valve and at a conspicuous location, to indicate the open and closed positions of the valve.

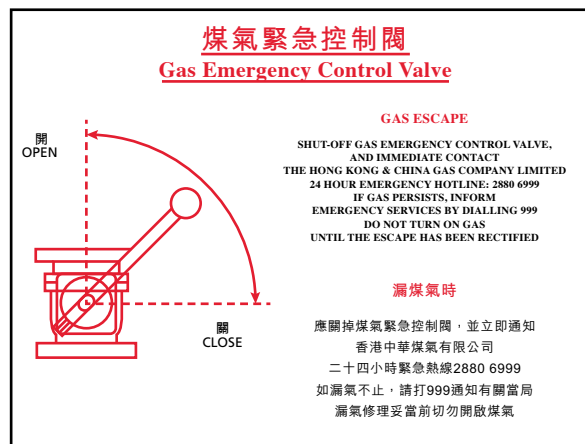


Figure 11: ON/OFF Notice of a Town Gas Emergency Control Valve

- (2) Layout of the fire escape route should be affixed at conspicuous locations.

3.2.2 Best Practice

- (1) Owners should establish an emergency procedure and keep an updated emergency contact list for the use of their employees in case of a gas incident. Owners should also arrange gas safety briefings for employees regularly to maintain a high level of safety awareness. Some useful telephone numbers for emergencies are tabulated as follows:

Government Departments	Telephone for Emergency
Fire Services Department/Hong Kong Police Force	999
Registered Gas Supply Company	24-hr Emergency Hotline
The Hong Kong China and Gas Company (Towngas)	2880 6999
Esso LPGas (Hong Kong) Limited (LPG)	2435 4511 (Esso)
	2495 3518 (Mobil)
DSG Energy Limited (LPG)	2322 2000 (Shell Gas)
Sinopec (Hong Kong) Petroleum Holding Company Limited (LPG)	2433 2111 (Sinopec)
Concord Oil (Hong Kong) Limited (LPG)	2333 4215 (Concord)
Rise Smart Industrial Limited (LPG)	6672 3328 (New Ocean)

3.3 Preventive Maintenance

3.3.1 General Practice

- (1) For repeated failures of ignition, there may be a malfunctioning of either the automatic ignitor or the flame failure device (FFD). One should stop using the appliance and arrange for a RGC to inspect and repair it.
- (2) The function of an interlock system is to suspend the gas supply to a gas appliance when its associated ventilation system fails. As such, malfunctioning of the ventilation system can trigger the interlock system to stop a gas appliance from operation. The owner/responsible person should arrange for a suitable registered electrical worker to inspect and repair the ventilation system.
- (3) If yellow flame or soot is observed, there may be some deficiencies with the gas or air supply components of the appliance. Kitchen staff may try to clean up the burner tips/caps with a wire brush. If the problem persists, the owner/responsible person should arrange for a RGC to inspect and repair it.

3.3.2 Best Practice

- (1) The owner should arrange and facilitate regular safety inspections for their gas installations including gas pipes, meter control valves and service valves, at an interval not exceeding 18 months and 12 months for domestic premises and non-domestic premises respectively, by a RGSC or RGC.

3.4 Spare Cylinders Management

3.4.1 General Practice

- (1) Owners, especially LPG cylinder users, should monitor the gas consumption rate in their catering premises. They should liaise with the LPG distributor for the timely supply of LPG and make sure that empty cylinders are collected from the premises to avoid storing LPG cylinders in excess of 130 litres aggregated water capacity on site.

3.4.2 Best Practice

- (1) If the gas consumption rate in the catering premises is so high that the owner cannot reach an agreement with the LPG distributor to maintain reliable gas supply, the owner should consider applying for the construction and use of a cylinder storage (i.e., NGI) in the premises in order to increase the storage limit of LPG cylinders.





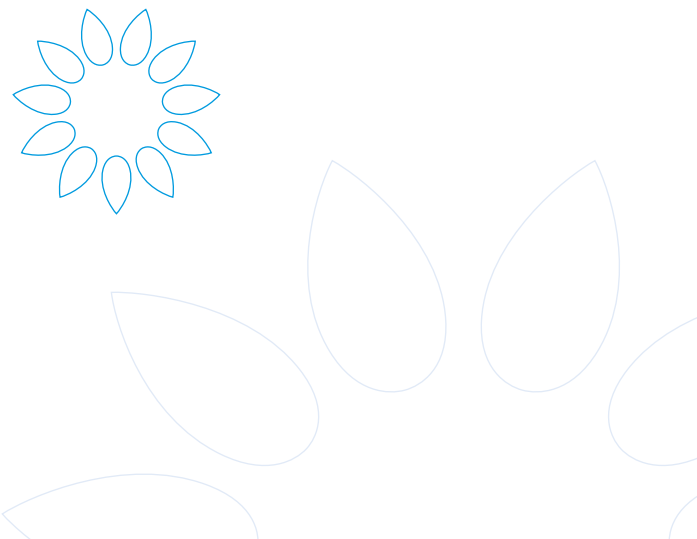
4 RECORD/DOCUMENTATION

4.1.1 General Practice

- (1) The owner should keep the inspection/maintenance records of the installations for a period of not less than 2 years from the date of the inspection/maintenance.

4.1.2 Best Practice

- (1) The owner should keep the specifications and manuals, if any, of the gas appliances and safety devices as well as the layout plans of gas pipes, gas appliances and ventilation system for future reference by end users and maintenance staff.



Gas Authority  **EMSD**

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