

Gas Program

➤ Program Overview Manual

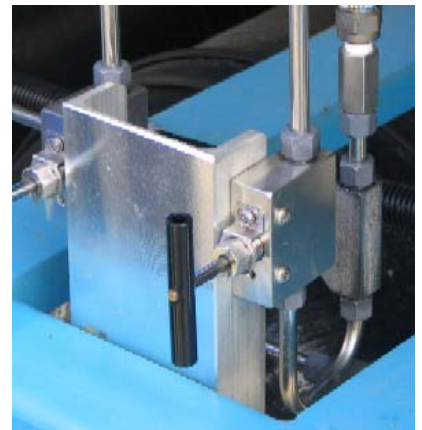


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Gas Program

Introduction

Natural gas is one of the cleanest, least expensive, most efficient sources of energy that can be used for heating, cooling, and cooking. Propane portability is used for barbecues, camping equipment, recreational vehicles, and boats. Furthermore, natural gas, propane, and even hydrogen are all used as fuel alternatives for transportation. The list of uses for these types of gases continues to grow.



Gas safety is a responsibility that everyone should have knowledge of. Whether it is installing a gas fireplace or excavating at a construction site, everyone needs to be aware of the appropriate safety requirements.

The BC Safety Authority's Gas Program provides safety services and administers gas safety in British Columbia. The objectives of the program are to ensure gas installations are safe and gas is used in a safe manner. To ensure the safety of people, products, and work practices regarding gas safety, the program applies standards consistently by enforcing the *Safety Standards Act*, the *Safety Standards General Regulation*, the *Gas Safety Regulation*, and the national codes.

Under the *Gas Safety Regulation*, gas equipment refers to anything that is used or designed to be used in connection with gas. These include such items as appliances, fuel containers, piping, and vents. On a larger scale, a gas system is any arrangement of gas piping that supplies gas to a single appliance or multiple appliances. All gas equipment and appliances and how they are installed must comply with the regulatory requirements.

Several types of gases are regulated under the program. These include natural gas, propane gas, liquid petroleum gas, digester gas, landfill gas, any mixture or dilution of these gases, and hydrogen. Digester gas is produced from the biological treatment of sewage. Landfill gas is produced from decomposed organic waste material from a landfill site.

With respect to the program's activities, the Safety Manager may review a Safety Officer's decision upon a client's request. If the client is not satisfied with the review, the client has the right to appeal the decision to the Safety Standards Appeal Board, which is independent of the BC Safety Authority. Some decisions, however, cannot be appealed by the client.



One of the functions of the program is to certify gas tradespeople in order to allow them to work in the province's gas industry. There are approximately 2,500 licenced gas contractors and 12,000 gas fitters active and registered.

Inspection services for gas installations go as far back as the 1950s and were conducted by the local fire departments.

Currently, the program provides these services to all of British Columbia. This means Safety Officers are required to inspect all homeowner gas installations within their jurisdiction. It is important that homeowners doing the gas work perform all necessary steps and the work is completed in a safe manner. The program, however, does not have jurisdiction over the residential and light commercial installations in the following areas:

- City of Vancouver
- City of North Vancouver
- District of North Vancouver
- Corporation of the District of Maple Ridge
- Burnaby
- Richmond
- Kelowna

Local governments in each of these jurisdictions are responsible for the safe installation of natural gas equipment and installations and for issuing permits within its own area through a delegation agreement with the province. These local governments perform inspections in residential and light commercial installations up to a total connected meter load of 409,600 BTUs.

Overall, the Gas Program oversees gas safety and regulates natural gas and propane installations for the residential, commercial, and industrial sectors.

Services

The Gas Program provides several safety services in British Columbia. Besides regulating the storage, distribution, and use of gas, the program oversees the installation, operation, and alteration of gas equipment and appliances in the residential, commercial, and industrial sectors.

The roles and responsibilities of the Safety Manager and Safety Officers focus on administering the *Safety Standards Act*, the *Safety Standards General Regulation*, and the *Gas Safety Regulation*. These are their guides to ensure all clients comply with the regulatory requirements when installing or using gas equipment and appliances. As well, the program educates and informs clients (including homeowners) on safety issues and works with industry.



Holding tanks

Safety Manager

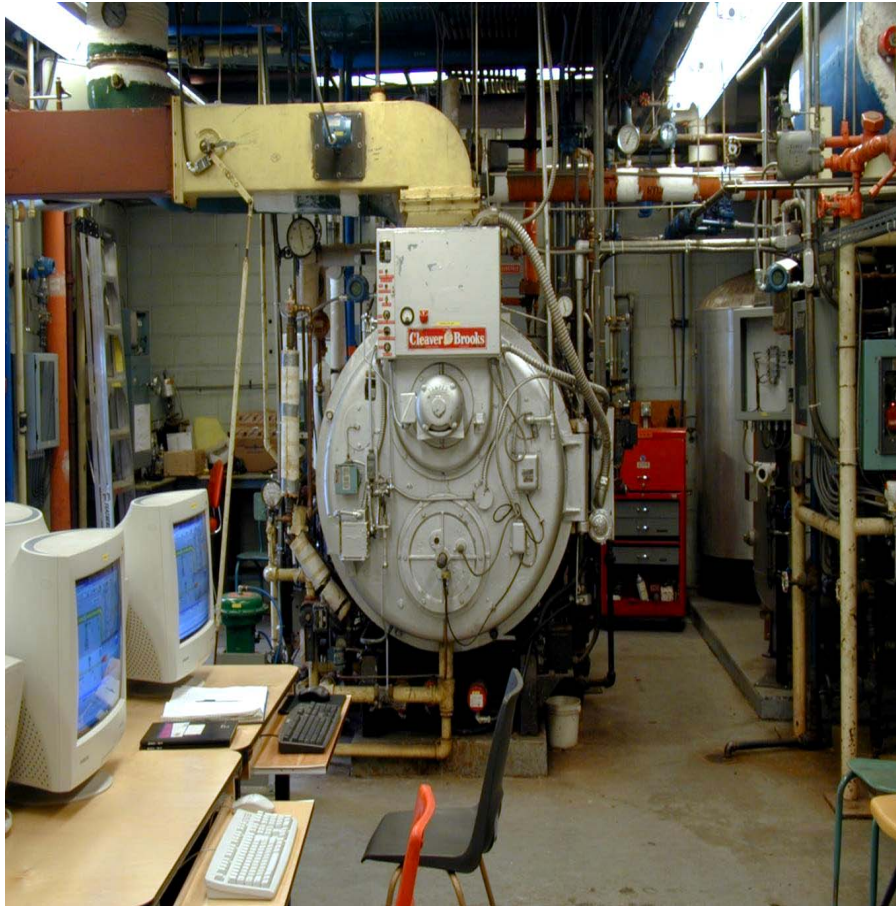
The BC Safety Authority appoints the provincial Safety Manager, who has the power to do the following: issue directives, information bulletins, safety orders, and safety advisories; issue, suspend, or revoke contractors' licences; and issue gas fitter Certificate of Qualifications. The Safety Manager also provides technical advice and support to Safety Officers, recommends regulatory changes, provides input on internal policies, provides advice on risk management systems, and analyzes the root causes and statistics of incidents.

The Safety Manager represents the BC Safety Authority at appeal hearings and technology committee meetings. Another role of the Safety Manager is to bring provincial safety issues to the table at national code committees on behalf of the province. The Safety Manager also approves uncertified gas appliances and assists manufacturers with one-of-a-kind solutions in their research and development of innovative products.

Other duties include approving and administering exams for gas fitters, issuing discipline orders and monetary penalties, and reviewing any decision made by a Safety Officer upon a client's request. The Safety Manager may also request clients who hold a contractor's licence, certificate, permit, or any other permission under the *Safety Standards Act* take an examination to prove their qualifications in order for them to maintain their status.

Safety Officers

Safety Officers are at the forefront when dealing with clients and provide the following services: conduct inspections; answer inquiries; educate on safety; investigate incidents; check that workers are qualified to perform regulated work; review and grant variances; issue, suspend, or revoke permits; issue compliance orders; and recommend monetary penalties.



Licences

Becoming a licenced gas contractor does not require any specialized training; however, the applicant must employ certified individuals. Obtaining a licence requires the applicant to acquire a gas surety bond from an insurance company. The applicant must then send the original copy of the bond to the BC Safety Authority. In all cases, a licenced gas contractor (or permit holder) cannot allow a worker to perform regulated work that is beyond the scope of the qualification of that worker. Contractor licences must be renewed annually.

Certificates of Qualifications

The program issues Certificates of Qualifications to applicants who are qualified as gas fitters. Gas fitters must be certified, or if not certified then supervised by a certified gas fitter, to perform regulated gas work, such as installing or altering regulated gas systems and products. Currently, there are two classes of gas fitters: Class A and Class B.

With the exception of working on vehicle fuel systems (liquefied petroleum gas, compressed natural gas, or hydrogen), Class A allows for an unlimited scope in regulated gas work a gas fitter may perform. On the other hand, a Class B certification places a limit on the size and type of the gas equipment an individual may work on. Being certified as a Class A gas fitter requires certification as a Class B gas fitter for a minimum of two years and successfully completing the Class A exam.

For certification as a Class B gas fitter, the individual must have industry training credentials in such areas as plumbing, steamfitting, refrigeration, sprinkler fitting, or gas fitter apprenticeship, take an approved course, and pass the certifying exam.

Certificate of Qualification	
Type	Work Allowed Under the Appropriate Permit
Class A Gas Fitter	Install or alter any gas system except vehicle fuel systems.
Class B Gas Fitter	Install or alter the following gas systems: fan assisted appliances or natural draft appliances; appliances and vents up to and including 220 kW; and piping and atmospheric vents.
Gas Appliance Service Technician	Service gas appliances installed for residential use and light appliances up to an input of 82 kW.
Gas Piping	Install and test gas piping; must not install, service, or commission gas appliances.
Recreation Vehicle Installation and Service	Maintain, alter, repair, and install vehicle gas systems in recreational vehicles.
Liquefied Petroleum Gas Vehicle Conversion	Maintain, alter, repair, and install liquefied petroleum gas vehicle fuel systems.
Compressed Natural Gas Vehicle Conversion	Maintain, alter, repair, and install compressed natural gas vehicle fuel systems.
Compressed Natural Gas and Liquefied Petroleum Gas Vehicle Conversion	Maintain, alter, repair, and install compressed natural gas and liquefied petroleum gas vehicle fuel systems.
Gas Venting	Alter, repair, and install venting.
Gas Utility	Relight gas equipment with an input of 120 kW or less; replace thermocouples; perform minor repairs; and conduct safety checks when employed by a utility.
Special Purpose Gas	Perform regulated work under the specific conditions specified on the certificate.

The *Gas Safety Program* certifies various gas trade workers.

Class A and Class B gas fitters may perform a limited amount of electrical work. If employed by a licenced gas contractor or working under an operating permit, with some restrictions the gas fitter may install, repair, or do maintenance of electrical wiring for solid, liquid, and gaseous-fueled-fired heating equipment.

Product Approvals

All gas equipment or appliances for installation or use in the province must display a certification mark or an approval mark. Products that are counterfeit or non-certified are of substandard quality and can pose a risk to public safety. Owners, manufacturers, and installers of gas equipment may apply to have their products approved by the BC Safety Authority if their gas equipment does not bear the seal of a recognized testing agency. This includes any gas equipment that may otherwise have been approved outside of British Columbia.



Product approval decal

A Safety Officer will attend the site of the equipment to examine and view tests on the product to the test procedures outlined in the standards. In some cases, an engineering team at the BC Safety Authority will evaluate the product to see if it conforms to a standard that the program uses as a reference. Sometimes, the applicant will need to submit designs and drawings for review. If requested, the applicant is to send the product to an external testing agency. If the product

fails to meet the standards, the applicant is to make modifications to the product. Once the product has met all the regulatory requirements, a Safety Officer attaches a decal to the product to indicate that it has been approved.

Inspections

Safety Officers conduct inspections by attending the sites of gas equipment installations, whether it is a residential, commercial, or industrial site. Gas leaks and improper storage of gas are generally the most serious of identified non-compliances. A non-compliance is any regulated work or equipment that fails to meet the codes and regulatory requirements.

For gas work done by licenced contractors, the Safety Officer may conduct risk based inspections relative to the risk involved on the installation of the gas equipment. Risk is

calculated by taking into consideration the gas contractor's performance history and experience, the type of installation to be completed, and the type of inspection requested. These factors result in a score value that the Safety Officer can access through the BC Safety Authority computer system and apply to an inspection request.

After completing an inspection, the Safety Officer records the results into the BC Safety Authority's computer system and issues a Certificate of Inspection to the client.

Installation Permits

Homeowners and licenced gas contractors require an installation permit to install or alter gas appliances such as furnaces, clothing dryers, fireplaces, and hot water heaters. For some installation permits, the Safety Manager may request the applicant submit technical drawings of the gas system or proposed gas system with the application.



During the completion of each phase of installing the gas system, the holder of the permit or the representative of the holder of the permit has several duties. One of the duties is to notify the BC Safety Authority that the regulated work complies with the regulatory requirements. This is accomplished by sending in a notification of completion, installation, or alteration form.

Operating Permits

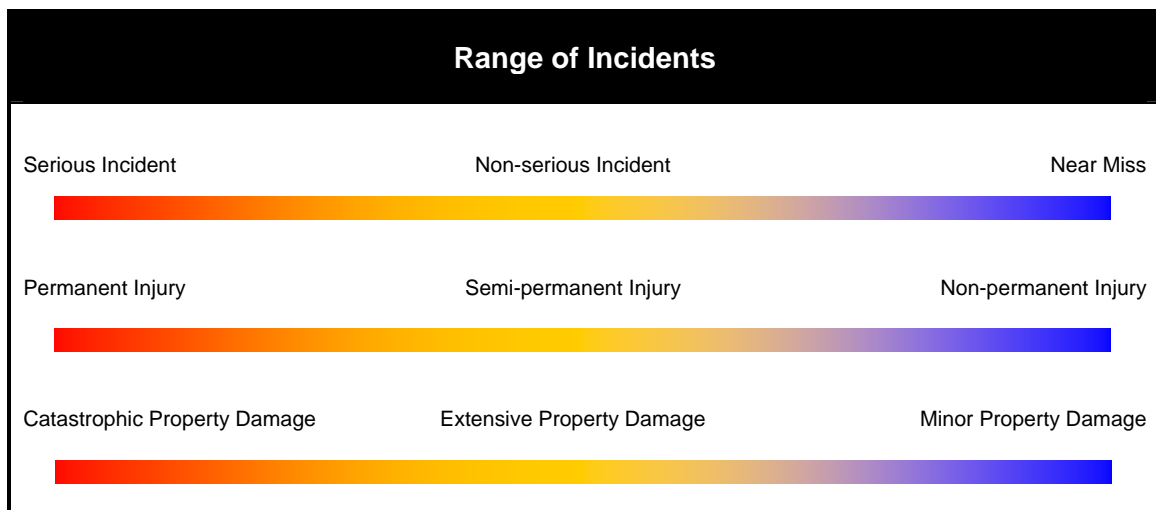
Operating permits must be renewed every year. The program issues over 2,400 operating permits to industrial and commercial owners of gas systems. These include distribution or storage of gas, propane bulk plants, and filling stations (natural gas and propane vehicle or cylinder). In addition, those owners applying for a Class 4 (vehicle conversion to either propane or natural gas or both) or a Class 5 (recreation vehicle) operating permit need to submit a surety insurance bond with the application.

Investigating Incidents

Incidents involving gas equipment and systems are dangerous and can lead to fatalities. A gas-related incident may result in a fire, explosion, gas leak, or carbon monoxide poisoning. Another example of an incident is accidentally damaging a buried gas line during excavation.

The *Safety Standards Act* defines an incident as the occurrence of a death, personal injury, or damage to property, or the risk of personal injury or damage to property. An incident, in this case, is the result of regulated work or the testing, use or operation of a regulated gas equipment or appliance. The levels of incidents, personal injury, and damage to property can range from serious to minor.

A Safety Officer may investigate an incident as soon as it is brought to the attention of the BC Safety Authority. After conducting an investigation, the Safety Officer prepares a detailed report. If the incident is the result of defective gas equipment, the Safety Manager may issue a safety order to clients stating any action necessary to eliminate any hazard.



Incidents involve personal injury or damage to property and range from serious to minor.

Collecting data from incidents improves how the Gas Program assesses risks regarding gas equipment and regulated work. Data for a *near miss* can be just as revealing as an actual incident. A near miss is an event that has occurred but in this instance did not result in any injury or property damage. In a similar situation, this event has the potential to result in injury, death, or property damage. Unfortunately, not all incidents are reported to the BC Safety Authority. Incident reporting helps the program to gain knowledge and accumulate data. These resources are beneficial when reviewing the codes in order to prevent similar incidents from happening again.

Information for Homeowners

Most homeowners are not qualified as gas fitters and need to be aware of the potential hazards involved when installing or altering gas appliances, such as a barbecue or stove. There is the possibility of posing a risk to public safety; therefore, it is critical for a Safety Officer to conduct an inspection at various phases as the homeowner completes the installation or alteration. This is to ensure that the result is a safe installation and complies with the codes and regulatory requirements.



Inspections are required when doing a pressure test on the gas piping, before any portion of the installation is to be enclosed or concealed, and at the time when the installation or alteration is completed and the gas appliance is operating. The homeowner also needs to complete the notification of installation or alteration form as a request to inspect the work once it has been completed.

While at the residence, the Safety Officer may inspect the fireplace, venting, gas piping, and meter connections or to ensure that there is an adequate supply of combustion air. It is necessary to have enough airflow for any gas appliance, furnace installation, or water heater that is installed in the home.

After the homeowner has completed the installation, the Safety Officer will return to inspect that all the appliances are operating correctly. All the gas appliances are to be turned off so that the Safety Officer can conduct a dial test on the meter.

Safety Officers will not correct any leaks or make any adjustments to any of the appliances or connections but will notify the homeowner of any non-compliances through the use of a Certificate of Inspection document. The homeowner would be required to correct these issues in a timely manner.

A homeowner that has the confidence and sufficient knowledge to do regulated work, such as installing gas equipment, may apply for an installation permit. The single family dwelling must meet certain conditions:

- The home must be fully detached and no part of it is being rented out to any other person;
- The owner must live, or intend to live, in that home; and
- No one else is to be paid to perform the work or help the homeowner do the work.

Homeowners also need to complete the *Gas Homeowner Questionnaire* (which the BC Safety Authority supplies in an information package) and submit it with their installation permit application.

Homeowners need to know the principles of gas safety as most incidents are a result of people who are unaware of the safety factors involved. Natural gas and propane are non-toxic but can be explosive. The combustion products or fumes the appliance creates must be exhausted from the home or building through a vent or chimney system. Incidents involving gas appliances are often related to a faulty vent or chimney.



Carbon monoxide, which is produced when natural gas or propane gas are not burned completely, can also be the cause of an incident. This may be the result of the improper installation or operation of a gas appliance, or one that is poorly maintained.

Using safety practices and exercising caution can prevent many of these types of incidents. A basic test of applying soap and water to the supply piping connection can spot a leak. Correcting the adjustment to the connection may prevent an incident from occurring. Gas equipment safety is critical and the program is developing ways to increase public awareness.

Variances

A client may request a variance, which is a formal document that allows a client to deviate from the codes and regulatory requirements for a one-time circumstance without compromising safety. Assurances would be in place to ensure an equivalent level of safety.

Equivalent Standards Agreements

An Equivalent Standards Agreement is a formal agreement between a client and the Safety Manager. It is an innovative way for the Gas Program to develop a working partnership with the client to ensure safety. This agreement allows the client operational flexibility on performing regulated work or using a regulated product in a different manner than is prescribed by the codes and regulations.

Before an agreement can be reached, the Safety Manager must be satisfied the alternative approach to the work or the use of the product is consistent with the objectives of the regulations and does not increase or create additional risk of injury or damage to property. The Safety Manager has entered into agreements with a major gas supplier that has the resources to fulfill the terms and conditions without compromising safety.

Accessibility and Communications

With regards to gas safety, communicating information is critical to the program. It is just as important for anyone to have access to BC Safety Authority employees. Clients may obtain many of the documents and forms at any BC Safety Authority office or access them through the website. Permit issuance for licenced contractors can be done online as well. By issuing various documents and holding annual contractor meetings, the program informs the public, clients, and stakeholders on safety issues, potentially hazardous products, and regulatory amendments.

The Safety Manager can issue any of four types of documents. Safety advisories are non-binding and non-statutory and inform or remind the public of existing potential hazardous products or unsafe practices. The Safety Manager issues a directive to clarify the interpretation of the codes and regulations, to provide direction on the application of a regulation, or to exercise the powers granted under the *Safety Standards Act*, regulations, or code. Information bulletins are non-binding and non-statutory and are issued to provide general information to the public, clients, stakeholders, and BC Safety Authority staff. Finally, safety orders are binding and are issued to prevent, avoid, or reduce the risk of personal injury or damage to property.

Communicating Information		
Recipients	Documents	Methods
<ul style="list-style-type: none"> • Clients • Homeowners • Public • Stakeholders 	<ul style="list-style-type: none"> • Safety advisories • Directives • Information bulletins • Safety orders 	<ul style="list-style-type: none"> • Website • Contractor Meetings • Direct notices • E-mail and phone

The Safety Manager may issue any of four documents to relay information to clients, stakeholders, homeowners, and the general public.

When the Safety Manager issues a safety order, it is sent out to as many affected clients as practicably possible. For example, a certain gas appliance is found to be defective or poses a risk to public safety. In this case, clients would be requested to report required corrections to the Safety Manager. At times, clients are not following the recommendations for maintenance of gas appliances as set by the manufacturer. If this hazard was brought to the attention of the Safety Manager, this would be another reason the Safety Manager may issue a safety order. It should be noted that improper maintenance can result in an incident, which is preventable.

Other Services

The program administers gas safety throughout British Columbia, which includes all residential areas within its jurisdiction. The public still needs to be made aware of the hazards associated with gas. Compressed gas can harness an incredible amount of energy and should be used and stored properly and safely. An ad hoc public safety awareness group has been established by the BC Safety Authority to develop a strategic plan to educate the public on gas safety. Public gas safety awareness is a critical feature of the program.



Greenhouse installations using landfill gas.

Resources

The Gas Safety Manager and support team are major resources for providing technical expertise to Safety Officers and industry stakeholders. Several years of work experience and competent technical knowledge along with interpersonal communication skills are important assets for the Safety Manager to have.

Clients may ask questions about the codes, regulations, and gas safety. Safety Officers should have full

knowledge of the *Safety Standards Act*, the *Safety Standards General Regulation*, and the *Gas Safety Regulation*. They also need to have thorough knowledge of the *BC Natural Gas and Propane Code*, which encompasses parts of the *National Standards of Canada* and the *Canadian Standards Association* codes. To further guide the Safety Officers, the BC Safety Authority provides additional training and continues to update and develop policies and procedures to follow.

An inspection may take place at residential, commercial, or industrial site. It is just as important, however, to inspect the work done by homeowners as many are most likely not qualified as gas fitters. Safety Officers may use some of the following tools during inspections:

- Thermometer
- Carbon monoxide detector
- Electronic gas leak detector
- Draft gauge
- Multi-meter
- Combustion analyzer
- Basic hand tools (screwdriver and pliers)
- Inclined manometer (read regulator setting)
- Magnehelic gauge (measure pressure)
- Stop watch (clock gas consumption)
- Manometer (read small pressure changes)

Due to technical advancements, the codes are continually changing. The BC Safety Authority provides additional training and resources for Safety Officers, who are encouraged to upgrade their knowledge by attending seminars and taking courses.



Hydrogen tank installed in vehicle.

Clients, Partners, and Stakeholders



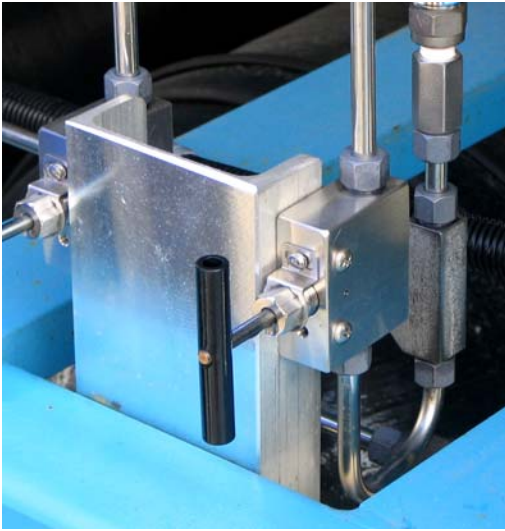
Any person or organization that is affected by the use of natural gas, propane gas, landfill gas, digester gas, or hydrogen gas is a client of the Gas Program. In order to better serve British Columbia in the delivery of gas safety services, the program maintains an open dialogue with its clients and industry stakeholders. Maintaining a solid working relationship with them is important to the Safety Manager and the Safety Officers.

Industry stakeholders rely on the program to provide consistent delivery of safety services and to participate at industry conferences. The following list outlines some of the areas where program is involved:

- Natural gas and propane equipment or appliance manufacturers
- Educational institutions
- Natural gas organizations
- Gas and propane utilities
- Fire and Rescue
- Heavy industry

Some of the groups that the Gas Program liaises with are as follows:

- Canadian Standards Association (CSA)
- Gas Processing Association Canada (GPAC)
- Propane Gas Association of Canada (PGAC)
- Canadian Gas Association (CGA)
- Canadian Energy Pipeline Association (CEPA)
- National Energy Board
- National Propane Gas Association (NPGA)
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Hydrogen Association (CHA)
- Hydrogen & Fuel Cells Canada
- Landfill Gas Industry Alliance



Valves for approval

An extension of the program is the Gas Technology Committee. This group is made up of representatives from propane and natural gas industry, municipalities, and educational institutions. Members of this committee review industry standards, identify safety issues, recommend changes to regulations, and evaluate the delivery of gas safety services. They also help the program develop policy and propose regulatory changes.

The Gas Program also works with the BC Common Ground Alliance, which is a non-profit organization. This group develops and offers consistent practices and coordination of activities relating to underground infrastructure, such as the excavation work near gas lines.

Their intent is to see the safety of the public and workers as well as damage prevention. Since 1996, this group has been involved with the “Dig Safely” campaign, which addresses the issue of damage that occurs during excavation work.





Future Growth

The use of natural gas and propane is increasing and it will be necessary for the Gas Program to meet the demands of the development and economic growth in British Columbia in its delivery of safety services. Raising public awareness on the program's safety services will be just as important as letting clients and stakeholders know how they can benefit from those services.

A strategic public awareness plan has been created in conjunction with industry representatives and stakeholders for educating the public on gas safety. Many homeowners are not qualified as gas fitters but are installing gas appliances and need guidance on how to install and operate gas appliances safely. Topics such as carbon monoxide poisoning and gas leak recognition are just some of the areas covered in this plan. Essentially, this will help the public gain a better understanding of gas safety.

The program continues to consult with other groups abroad on gas safety related issues. Development of the harmonization of codes and standards for hydrogen use is ongoing on an international level. As well, harmonizing with Alberta on the certification of gas fitters as per the Trade, Investment and Labour Mobility Agreement may help alleviate the growing demand for gas fitters and other tradespeople in this province. Such harmonization efforts are likely to extend throughout the rest of Canada.

Other areas of the program that require improvement will be looked at while maintaining a focus on safety as a priority. Increasing communications with local governments and other jurisdictions on the activities of the gas industry will help the program gain more knowledge on the risks associated with gas products and work practices as well as exchange more data from incident reporting.

The BC Safety Authority has a vision of being an internationally recognized authority by 2014 in the delivery of safety services. In order to reach that level, the Gas Program strives to offer the best and most up-to-date programs and retain qualified people with expertise to deliver those programs.

Revision History

Revision	Revision Date	Revision history	Revised by
00	2006/12/19	New release	Jeff Taylor

Approval

This document has been approved for adequacy by:



Wayne Lock
Provincial Safety Manager – Gas

December 19, 2006

Date