

## HIGH LEVEL SAFETY MEASURES FOR CUSTOMERS' GAS EQUIPMENT

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In Japan, gas companies are responsible for installing customers' gas equipment and conducting periodical inspections in order to ensure customers' safety. The Japan Gas Association (JGA) recognizes that fatal accidents related to gas reduce the value of city gas, and so safety measures are indispensable to increase the gas market. The JGA therefore encourages voluntary safety measures based on past experience of accidents and disasters under the slogan "Zero fatal accidents."

As a result, the number of fatalities caused by gas accidents in the last 5 years in Japan has fallen to 3 or 4 per year among approximately 28 million customers. However, the JGA will continue to promote the voluntary safety measures until the number of gas-related fatalities falls to zero.

In Japan, gas companies are responsible for the safety of customers' gas equipment, and their specific tasks include:

- a) To ensure the gas facilities comply with the legal technical standards.
- b) To maintain safety concerning work, maintenance, operation, and periodical inspection of gas facilities.
- c) To check the flue equipment of specified gas appliances at regular intervals, and to make customers aware of how to use gas appliances safely.

Most of the fatal gas accidents in Japan have been caused by the customers' equipment (Figure 1). As mentioned above, the gas companies are responsible for the safety of customers' gas equipment. The JGA has added various voluntary safety measures to those obligations in order to prevent fatal accidents caused by customers' equipment, as a result of which the number of such fatal accidents has fallen below one-tenth of the number in 20 years ago (Figure 2). Currently, demand for gas is growing in spite of tough energy competition between city gas, LP gas, kerosene, and electricity (Figure 3).

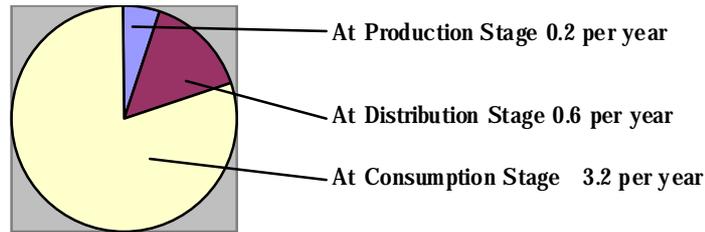


Figure 1. Annual gas-related fatalities in Japan (Average of past 5 years 2003, 2004, 2005, 2006, and 2007)

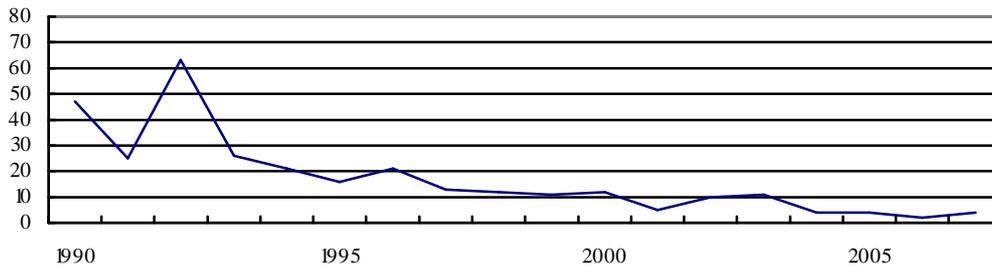


Figure 2. Number of gas-related fatalities at the consumption stage in Japan



Figure 3. Sales of city gas by volume growing faster than GDP in Japan

In order to prevent accidents, it is important to develop and standardize hardware such as safety-conscious gas appliances, safety-conscious gas piping systems and intelligent gas meters. However, the proper installation and use of gas facilities and appliances are as important as these technological developments.

The JGA continually collects and analyzes information on accidents and damage caused by disasters, and uses the results both for technological development and for improving construction and maintenance methods. In the latter category, the JGA focuses on the following voluntary certification systems and technical standards. A high level of safety is achieved by combining these measures.

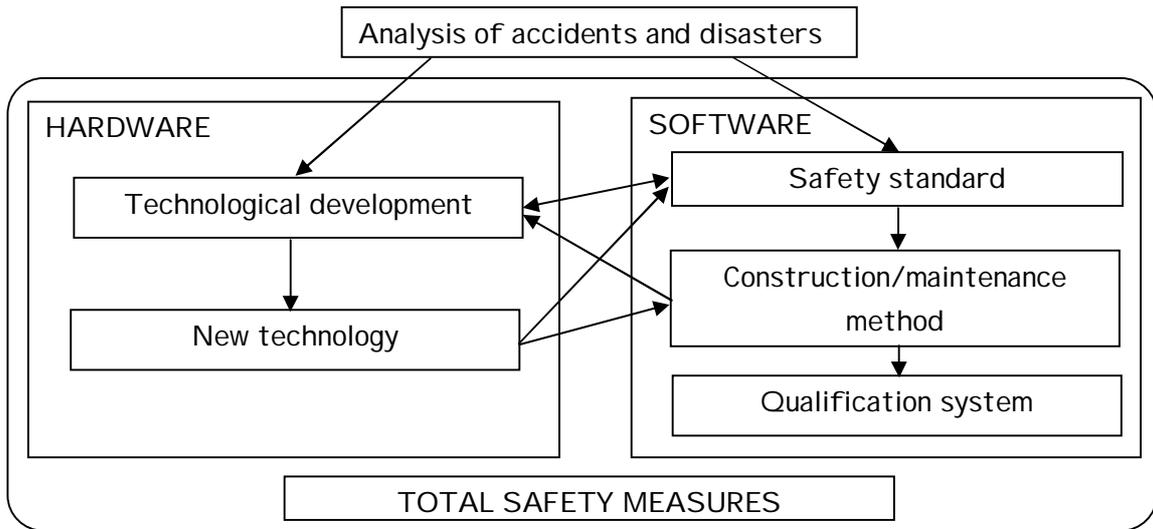
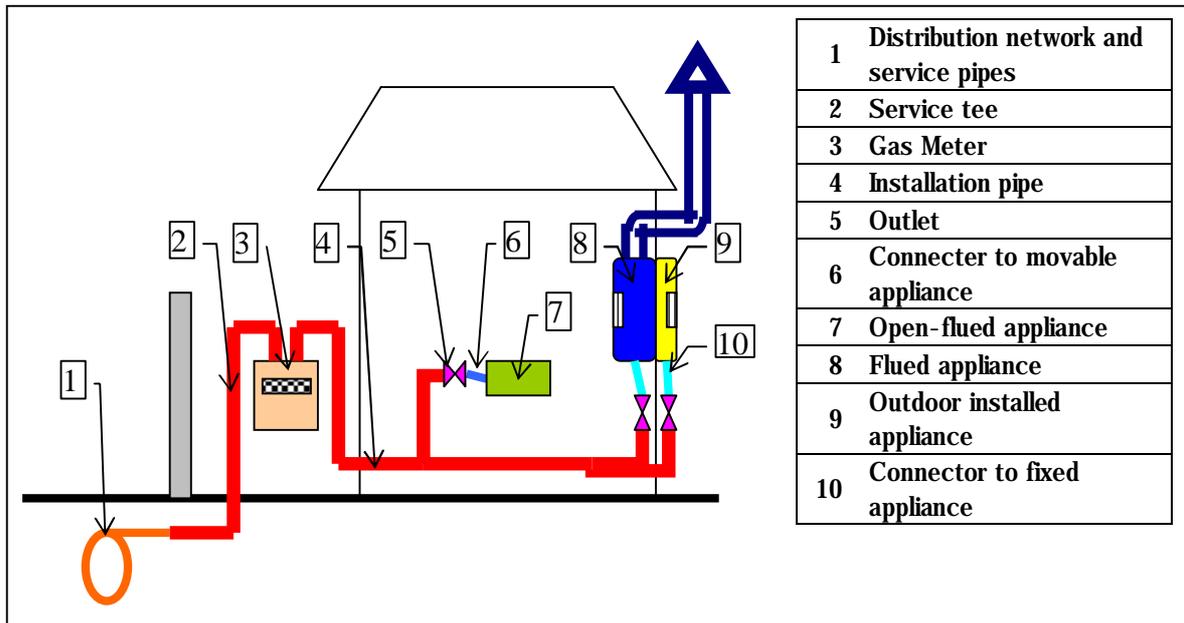


Figure 4. Total safety measures of the JGA

The JGA safety measures are classified as follows.

	Installation (For proper equipment)	Inspection (For proper equipment and use)	Public relations (For proper use)
Gas facility*	JGA House Pipe Constructor Qualification	JGA Customers' Gas Equipment Inspector Qualification	'Safe-Gas-Life 21' Campaign
Gas appliance	Supervising License of Installation Work of Specified Gas Appliance Gas Appliances Installer Qualification		

\*Gas Facility: gas pipes, including gas taps



Qualification	JGA House Pipe Constructor Qualification	Supervising License of Installation Work of Specified Gas Appliance	Gas Appliances Installer Qualification	JGA Customers' Gas Equipment Inspector Qualification
	Voluntary	National License	Voluntary	Voluntary
Established	April 2007	May 1979	April 1997	October 1976
Object	Install, exchange, disconnect, repair ②、③、④、⑤、⑥、⑩	Install, exchange ⑧	Install, exchange ⑨、⑩	Inspect ②、④、⑤、⑥、⑦、⑧、⑨、⑩、

### 1. Construction of house pipe

The JGA has established a voluntary technical standard for the design and installation of gas safety equipment based on experiments of accidents like gas leaks and earthquake disasters. The JGA has also compiled a standard installation manual and a training program for workers, and manages the JGA Voluntary House Pipe Constructor Qualification to ensure that customers' gas equipment is installed properly. The JGA awards this qualification to workers who have received training and passed an examination on their knowledge and technical skills based on the voluntary technical standard, and registers them as qualification holders. The foreman of a team which installs house pipes must have this qualification. Generally, gas equipment cannot be installed by non-qualified persons. The qualification is valid for 3 years, and qualified persons receive training on the latest technology, laws, and accidents to extend their qualification. Even if qualified, if the person does not do a proper job, the gas company

may revoke his/her qualification. Thus, the JGA strives to maintain the quality of works to prevent gas accidents.

The House Pipe Constructor Qualification is categorized into four kinds of basic qualifications and three kinds of additional qualifications by difficulty of installation and by what to install. A qualified person can hold both the basic and the additional qualification. There are 35,173 qualification holders in Japan (March 2008).

Table 1. Qualification categories and number of qualification holders

	Category	Training	Qualification holders
Basic qualification	Category 3 House Pipe Constructor	3-day training	5,151
	Category 2 House Pipe Constructor	4-day training	7,823
	Category 1 House Pipe Constructor	2-day training	21,301
	House Piping Welding Manager	4-day training	3,882
Additional qualification	Pipe Threading Technique	1-day training	4,361
	Hot Branch Technique	1-day training	24,383
	Low Pressure Welding Managing	1-day training	2,276

Applicants for these qualifications take written and practical examinations published by the JGA on the last day of the training. The tests are prepared and examined by the JGA Technical Committee. The pass mark is 70% for both the written and practical examinations. If an applicant fails one of the examinations, they may take the examination once again.

## 2. Installation and exchange of gas appliances

It is considered in Japan that proper installation of gas appliances effectively prevents accidents. A national license is required to install and exchange specified gas appliances such as flued bath water heaters, flued water heaters and associated flue pipes.

For general appliances other than specified appliances, voluntary standards for installing gas appliances have been established by the Gas Appliances Inspection Association. In addition, the voluntary gas appliances installer certification system is managed by a third-party institution which is composed of consumers' organizations and related industry specialists. The JGA recommends this system and participates in its committee. The purpose of this qualification is to ensure the provision of safe and convenient gas appliances, as well as proper installation and explanation of proper usage to the customers.

## 3. Inspection

The gas company regularly checks the safety of the flues of gas appliances, checks house pipes for leakage, and informs the customers how to use gas appliances safely.

The JGA manages the JGA Customers' Gas Equipment Inspector Qualification to raise the quality of these legal checks. The JGA awards this qualification to inspectors with sufficient business experience, who have received training and passed paper examinations.

This qualification is valid for 3 years, and qualified persons receive training based on experience of past accidents and disasters every 3 years to extend their qualification. As for old gas appliances, manufacturers are obligated to inspect them.

Table 2. Qualification categories and number of qualification holders

Category		Qualification holders
Category 1	House Pipe and Appliance Inspector	34,896
Category 2	Appliance Inspector	226
Category 3	House Pipe Inspector	172

#### 4. Public relations

The JGA runs safety campaigns for the gas industry. Especially every autumn, the JGA conducts a big 'Safe-Gas-Life 21 Campaign' in cooperation with the government. Usually, gas companies conduct safety campaigns at the time of the sales campaign before winter to make customers better aware of how to use gas appliances safely. The JGA prepares various tools and leaflets to be distributed to customers.

In order to eliminate fatal accidents, users must also be made more safety conscious. The JGA plans various forms of public relations according to the times, diversification of lifestyles, and aging of society.

The JGA considers that public relations on safety should be tailored to various types of customers, including elderly families and young people who live alone as well as ordinary families.

Some gas companies visit the elderly people who live alone in cooperation with welfare organizations in their areas. The JGA supports and promotes these activities, and supplies related information to the entire gas industry. The JGA also promotes safety activities in cooperation with local organizations.

The JGA prepares and provides teaching materials on the safe use of gas appliances for school education. The JGA aims to create a culture in which every customer can use gas safely, by educating the next generation.