

# Overview of the High Pressure Gas Safety Act in Japan

## 1. Introduction

If handled incorrectly, the high pressure gas widely used in industry can cause damage not only to the plant in which it is being handled, but also to the surrounding area. For this reason, in accordance with the High Pressure Gas Safety Act, any compressed gas greater than or equal to 1MPa (0.2MPa for compressed acetylene gas and liquefied gas) is classed as high pressure gas in Japan, and its production, storage, and sale are strictly regulated.

Details of the act mainly consist of: a) Conformity of facilities and equipment with technical regulations, b) Preparation of manuals related to safe administration by the operators, and c) Allocation of qualified personnel.

In addition to the High Pressure Gas Safety Act for regulating the high pressure gas itself, coordination is established with the Fire Services Act designed to prevent and extinguish the fire, the Industrial Safety and Health Law designed to ensure the health and safety of industrial workers, and the Act on the Prevention of Disasters in Petroleum Industrial Complexes and Other Petroleum Facilities designed to prevent occurrence of disasters within areas of petrochemical complexes, thereby maintaining the safety of high pressure gas handling in Japan. <sup>(Note)</sup>

**(Note)** The High Pressure Gas Safety Act, the Fire Services Act, the Industrial Safety and Health Law, and the Act on the Prevention of Disasters in Petroleum Industrial Complexes and Other Petroleum Facilities are collectively referred to as the 'four safety acts.'

## 2. The High Pressure Gas Safety Act

Handling of high pressure gas, and manufacturing of facilities and equipment to handle high pressure gas, are regulated by the High Pressure Gas Safety Act. Any person who handles high pressure gas must understand the High Pressure Gas Safety Act before attempting to handle such gas.

### 1) Purpose

The purpose of this act is to prevent disasters caused by high pressure gas and secure public safety. <sup>(Note)</sup> The following activities are being implemented to accomplish the objectives of the act:

- a) Regulate high pressure gas operators through administrative licensing and inspections.
- b) Promote voluntary safety activities by private business operators themselves and the High Pressure Gas Safety Institute of Japan.

**(Note)** Article 1 of the High Pressure Gas Safety Act: "For the purpose of preventing disasters caused by high pressure gas, this act regulates production, storage, sale, transportation and other related handling of high pressure gas, while promoting voluntary safety activities by private business operators and the High Pressure Gas Safety Institute of Japan, ultimately aiming to secure public safety.

### 2) Definitions of high pressure gas

Substances falling under any of the following categories are called high pressure gas. (Pressure is referred to as the gauge pressure.)

Compressed gas	a) Gas pressure of 1MPa or greater at the normal operating temperature b) Gas pressure of 1MPa or greater at 35°C
Compressed acetylene gas	a) Gas pressure of 0.2MPa or greater at the normal operating temperature b) Gas pressure of 0.2MPa or greater at 15°C
Liquefied gas	a) Gas pressure of 0.2MPa or greater at the normal operating temperature b) Temperature for the gas pressure to reach 0.2MPa is below 35°C
Other (liquid hydrogen cyanide, liquid bromomethane, liquid ethylene oxide)	Pressure greater than 0Pa at 35°C

### 3) Characteristics of the High Pressure Gas Safety Act

The act regulates the entire life cycle of high pressure gas, from manufacturing, sale transportation and consumption, to disposal.

### 4) High pressure gas excluded from the High Pressure Gas Safety Act

The high pressure gas used for the electricity and gas in public utilities is regulated by the Electricity Business Act and the Gas Business Act, respectively, while the high pressure gas used for trains, ships, and aircraft is regulated by individual acts with control equivalent to that of the High Pressure Gas Safety Act; therefore, this act is not applicable.

### 5) Principle regulations for 'production'

The 'production' of high pressure gas means artificial generation of high pressure gas for purposes such as a) Generation of high pressure gas from low pressure gas, b) Increase of high pressure gas pressure, c) Production of high pressure gas with lower gas pressure than that of the original, d) Conversion of gaseous body to generate high pressure liquefied gas, e) Vaporization of liquefied gas to generate high pressure gas, f) Filling of high pressure gas into containers.

For production of high pressure gas above certain volumetric capacity, the following rules are applicable:

- a) Each plant must obtain a permit from prefectural governors (hereinafter referred to as the governor).
- b) Once the production facility is completed, a completion inspection by the governor must be undertaken <sup>(Note 1)</sup> and be successfully qualified.
- c) The production facility must be maintained to meet the 'technical regulations prescribed by laws (hereinafter referred to as the 'technical standards')' related to the production facilities, and produce high pressure gas in accordance with the technical standards related to the production methods.
- d) The operator must establish a hazard prevention manual (manuals specifying disaster prevention and security activities must be undertaken by the operator upon occurrence of a disaster).
- e) The operator must specify operational safety education programs and educate the employees.
- f) The production facility must be subjected to a safety inspection <sup>(Note 2)</sup> within the specified period.
- g) The operator must undertake periodical self-inspection at least once a year.
- h) When applying any changes to the production facility or production method, permission must be obtained from the governor, and notification must be issued upon completion of the change.
- i) Books listing items necessary for safety must be maintained.
- j) The operator must appoint a safety controller and a supervisory safety worker.

Notifications and adherence to technical standards are necessary even when producing high pressure gas below a certain amount.

(Note 1) A completion inspection is an inspection to verify whether locations, structures, and equipment for the completed facility adhere to the technical standards (such as indication of plant boundaries, appropriateness of materials used for the gas facility, and sufficient strength of the high pressure gas facility), through means such as a visual inspection, test, record verification, or inspections of drawings. The facility must pass this inspection undertaken by the governor, or those equivalent, prior to starting its operation.

(Note 2) A safety inspection is an inspection to verify whether the production facility is appropriately conformed to the technical standards, through means such as visual inspection, test, record verification, or inspections of drawings. Operators must subject their facilities to this inspection undertaken by the governor, or that equivalent, on an annual basis.

### 6) Principle regulations for 'storage'

The 'storage' of high pressure gas means the state when high pressure gas is kept in containers or storage tanks. For storage of high pressure gas, the following rules are applicable:

- a) Storage of high pressure gas above a certain volumetric capacity requires permission from the governor, or a notification issued by the governor.
- b) The operator must administrate the storage facility in accordance with the 'technical standards related to the storage methods.'

- c) In the case of the Class I Storage Place designated for storing high pressure gas above a certain capacity, a completion inspection related to the storage facility must be undertaken.
- d) The operator must offer operational safety education to the employees.
- e) Books listing items necessary for safety must be maintained.

#### 7) Principle regulations for '**sale**'

The 'sale' of high pressure gas means continuous and repetitive delivery of high pressure gas for commercial purposes. For sale of high pressure gas, the following rules are applicable:

- a) The operator must issue notification to the governor per each store basis.
- b) The operator must inform purchasers of the required disaster prevention measures.
- c) High pressure gas must be sold in accordance with regulations (technical standards related to business entities, storage, and transportation).
- d) The operator must offer operational safety education to the employees.
- e) Books listing items necessary for safety must be maintained.
- f) The operator must appoint a Sales Safety Chief.

However, in case of sales of liquefied petroleum gas (LPG) to general consumers (for household use or commercial use for purposes such as bars and restaurants), the LPG Act will be applicable.

#### 8) Principle regulations for '**transportation**'

The 'transportation' of high pressure gas means transportation of containers filled with high pressure gas, or transportation of high pressure gas itself via gas pipes. For transportation of high pressure gas, the following rules are applicable:

- a) When transporting high pressure gas, measures must be taken for the container to meet the necessary safety requirements.
- b) When transporting high pressure gas by vehicles, the technical standards prescribing loading and transportation methods must be adhered to.
- c) When transporting high pressure gas via gas pipes, the facility must be installed and maintained in accordance with the technical standards.
- d) Any transportation must be monitored by qualified personnel.

#### 9) Principle regulations for '**consumption**'

The 'consumption' of high pressure gas means usage of high pressure gas by converting high pressure gas to low pressure gas. For consumption of specified high pressure gas, the following rules are applicable:

- a) The operator must issue notification to the governor.
- b) The operator must maintain consumption facilities to meet the technical standards.
- c) The operator must consume high pressure gas in accordance with the technical standards.
- d) The operator must appoint a Specific High Pressure Gas Operation Safety Chief.

#### 10) Principle regulations for '**disposal**'

'Disposal' of high pressure gas means safe disposal of high pressure gas contained within containers or facilities by methods such as diffusion into the atmosphere. For disposal of specified high pressure gas, the following rule is applicable:

- a) The operator must accord with technical regulations for disposal location, quantity, and other disposal methods.

### 3. FAQ

Q1 : What does the plant described in this document mean?

A1 : The plant is a place where a single business activity takes place, located within a continuous area, standing without any separation by third party land such as a road. Specifically, entire factory premises are considered a single plant. However, in the case of refrigeration, a single piece of refrigeration equipment is considered a single plant in general. Therefore, under most circumstances, where there are several pieces of independent refrigeration equipment within a factory, each piece of refrigeration equipment is classed as a plant.

Q2 : What is a production facility?

A2 : It is referred to as a facility for producing high pressure gas, which is equipped with production equipment as well as the following:

Railway sidings, building structures including offices, platforms, container yards, storage tanks, feed water pumps (including pipes), security fences, boundary walls, underground storage compartments, fire extinguishers, detection alarms, warning signs, restricted access facilities, etc.

Q3 : What is production equipment?

A3 : It is referred to as the equipment used for high pressure gas production, and includes the following:

Gas equipment (pumps, compressors, towers and vessels, heat exchangers, pipes, joints and connectors, valves and other associated accessories), furnaces, gauges, motors powered by electricity or others, dispensers, gas cylinder trolleys for discharging remaining gas from used cylinders, etc.

Q4 : What are the processes for exporting high pressure gas to Japan?

A4 : When exporting high pressure gas to Japan, the importer must obtain permission from the governor of the landing place prior to import into Japan. The inspection is referred to as the import inspection in the High Pressure Gas Safety Act, which is designed to verify the conformity of the high pressure gas to the contents verification test, and a safety test of its containers is undertaken.

However, if high pressure gas is for products such as automobile shock absorbers or air suspension as specified by the Ministry of Economy, Trade and Industry, or inert gas used for aircraft life-jackets, import inspection by the governor is not required.

Q5 : What are the procedures when a high pressure gas-related accident occurs?

A5 : When any accident occurs, the operator must report to the police, fire department, and the prefectural government office. In case of a major high pressure gas accident, inspectors from the Ministry of Economy, Trade and Industry and the High Pressure Gas Safety Institute of Japan will verify the state of the accident, once the accident is contained. In addition, the High Pressure Gas Safety Institute of Japan also undertakes investigations into minor accidents which can be instructive for prevention of future incidents, and carry out analysis of accident trends over the course of several years, for the purpose of focusing on disaster prevention.

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