

Annual Report for Fiscal 2018

(April 1, 2018 - March 31, 2019)

The High Pressure Gas Safety Institute of Japan (KHK)

1. Business Environment and Overview of Operations

Japan's economy was on a moderate recovery trend through 2018 as the employment and income situations continued to improve, although some weakness still remained. Meanwhile, to foresee the future of overseas economies, various factors need to be considered such as Northeast Asian security situation, influences of trade conflicts on the global economy, China's economic outlook, and the uncertainty accompanying Brexit. Due attention should also be paid to the impact of these factors on Japan's economy.

Moreover, just as last year, huge natural disasters including torrential rain in western Japan and the Hokkaido Eastern Iburi earthquake have occurred, requiring continuous response.

In the field of high pressure gas safety, KHK assiduously carried out and stabilized the "fast track system" and "new system for accredited places of business", whose full-scale supplication was started as a part of the smartification of high pressure gas safety promoted by the Ministry of Economy, Trade and Industry. In relation to the former system, the assessment results were publicized on our website in FY2018 as the first example of taking advantage of the system. In relation to the latter system, the Ministry of Economy, Trade, and Industry authorized its third specific accreditation places of business in December 2018, and its first self-safety enhancement places of business in September 2018, based on preliminary investigations by KHK.

In addition, on March 4, 2019, we concluded the "Agreement of Cooperation regarding High Pressure Gas Safety" with the Yokohama City Fire Bureau. This is the first agreement between KHK and a local governmental authority which conducts high pressure gas safety administration.

KHK strengthened governance such as compliance and information security measures in view of its highly public responsibility. The Research and Development Center equipped with the latest test equipment was completed in July 2017, and continued the implementation of research and development meeting the demands of the present age also in FY2018. Furthermore, in FY2018, KHK strongly promoted structural reform efforts for which the plan was set out as early as 2017 considering KHK's future business management.

Looking at KHK's business in fiscal 2018, we were able to secure a reasonable balance of payments due to proactive and detailed sales development for ISO clients, solid incomes from inspections in our inspection business, and the increase of METI-contracted businesses to the Research and Development Center, as well as efforts of structural reform such as reviews of payment structure.

2. Overview of Financial Statements for Fiscal 2018

(1) Balance Sheet

Assets	(As of March 31, 2019)	
	2018	2017
	Million Yen	Million Yen
Current assets	1,812	1,627
Fixed assets	5,968	6,062
Tangible fixed assets	1,104	1,162
Intangible fixed assets	94	123
Investments	4,768	4,770
Total	7,780	7,688

Liabilities/Capital	2018		2017	
	Million Yen	Million Yen	Million Yen	Million Yen
Current liabilities	804	853		
Fixed liabilities	2,168	1,957		
Reserve	4,878	4,581		
Profit for the term	-70	298		
Total	7,780	7,688		

(2) Statement of Profit and Loss

Expenditure	(from April 1, 2018 to March 31, 2019)	
	2018	2017
	Million Yen	Million Yen
Ordinary expenditure	4,739	4,655
Operating expenditure	4,739	4,655
Extraordinary loss	2060	79
Corporate taxes, etc.	693	676
Profit for the term	-70	298
Total	4,671	5,032

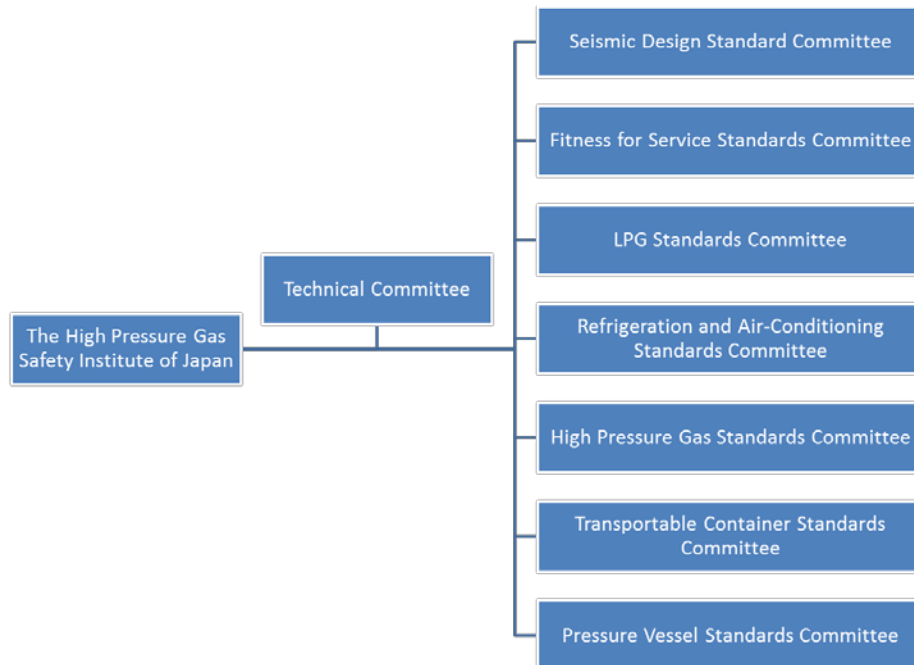
Income	2018		2017	
	Million Yen	Million Yen	Million Yen	Million Yen
Ordinary income	4,671	4,746		
Operating income	4,576	4,624		
Non-operating income	94	122		
Extraordinary income	390	286		
Total	4,671	5,032		

3. Overview of Each Activity

3-1. Development and Issue of Technical Standards

To promote safety in activities involving high pressure gas production, sale, consumption, and transportation, KHK establishes technical standards such as KHK Standards (KHKS) as well as reviews existing standards.

Committee organizations undertaking the preparation of technical standards are as follows:



Each committee consists of committee members appointed from among experts who have relevant knowledge and experience in high pressure gas or LPG safety.

In response to requests from the chairman of KHK, the technical committee decides basic policies for establishing the technical standards.

The technical standards are then established by each standards committee section in accordance with the basic policies, and the development and issue procedures maintain fairness and openness as the fundamental rule.

During fiscal 2018, the following standards were established, reviewed or abolished.

(a) Newly Established Technical Standards

- Standard for Composite Fiber Reinforced Plastic Pressure Vessel for Compressed Hydrogen (KHKS 0225)
- Standard for In-service Inspection (for Compressed Hydrogen Stand) (KHK/JPEC S 0850-9)
- Standard for Seismic Design of High Pressure Gas Equipment (Level 1) (KHKS 0861)
- Standard for Seismic Design of High Pressure Gas Equipment (Level 2) (KHKS 0862)
- Standard for Supercritical Fluid Extraction / Supercritical Fluid Chromatography System (KHK/JAIMAS 0901)

(b) Revised Technical Standards

- Standard for Safety Valve of Acetylene Container (KHKS 0125)
- Standard for Design and Manufacturing of LPG Container Valve (KHKS 0126)
- Standard for Facility of Refrigeration and Air-conditioning Equipment [Fluorocarbon and carbon dioxide Facility Part] (KHKS0302-1)
- Standard for Facility of Refrigeration and Air-conditioning Equipment [Fluorocarbon (Limited to Inert Gas and Less Than 20 Ton in Refrigeration Capacity) Facility Part] (KHKS 0302-2)

- Standard for Earthquake-Proof Automatic Gas Shut-Off Device for LPG (KHKS 0714)
- Standard for Metal Flexible Hose (Including Fittings) (KHKS 0715)
- Standard for Hose Bands (KHKS 0716)
- Standard for Installation of Gas Leakage Alarm for LPG (KHKS 0718)
- Standard for Gas Discharge Prevention Device for LPG (KHKS 0719)
- Standard for Safety Adapter for LPG (KHKS 0722)
- Standard for Gas Leakage Alarm and Shut-Off Device for LPG (KHKS 0723)
- Standard for Automatic Gas Shut-Off Device (Type II) Based on Microcomputer-based Flow Rate Detection for LPG (KHKS 0726)
- Standard for Flexible Tube (Including Flexible Tube Fitting) for LPG Piping (KHKS 0727)
- Standard for Automatic Gas Shut-Off Device (Type L) based on Microcomputer-based Flow Rate Detection for LPG (KHKS 0728)
- Standard for Root Valve with Checking Valve for LPG (KHKS 0731)
- Standard for Checking Valve Adapter for LPG (KHKS 0732)
- Standard for Flow Rate-Based Switchable Leakage Detection Device for LPG (KHKS 0734)
- Standard for Installation and Handling Procedure of LPG Facilities (KHKS 0738)
- Standard for Work for Filling Bulk Storage Tank with LPG (KHKS 0744)
- Standard for In-service Inspection (for Underground Rock Cavern of LPG storage) (KHK/JOGMEC S 0850-8)
- Standard for Seismic Design of High Pressure Gas Equipment (Level 1) (KHKS 0861)
- Standard for Seismic Design of High Pressure Gas Equipment (Level 2) (KHKS 0862)
- Periodical Self-inspection Guidelines (for Underground Rock Cavern of LPG storage) (KHK/JOGMEC S 1850-8)
- Technical Document on Underground Rock Cavern of LPG storage (KHK/JOGMEC TD 5800)

(c) Abolished Technical Standards

- Standard for Installation of Earthquake-Proof Automatic Gas Shut-Off Device for LPG (KHKS 0720)
- Technical Document on Composite Fiber Reinforced Plastic Pressure Vessel for Compressed Hydrogen (KHKTD 5202)

3-2. Inspection, Examination and Accreditation

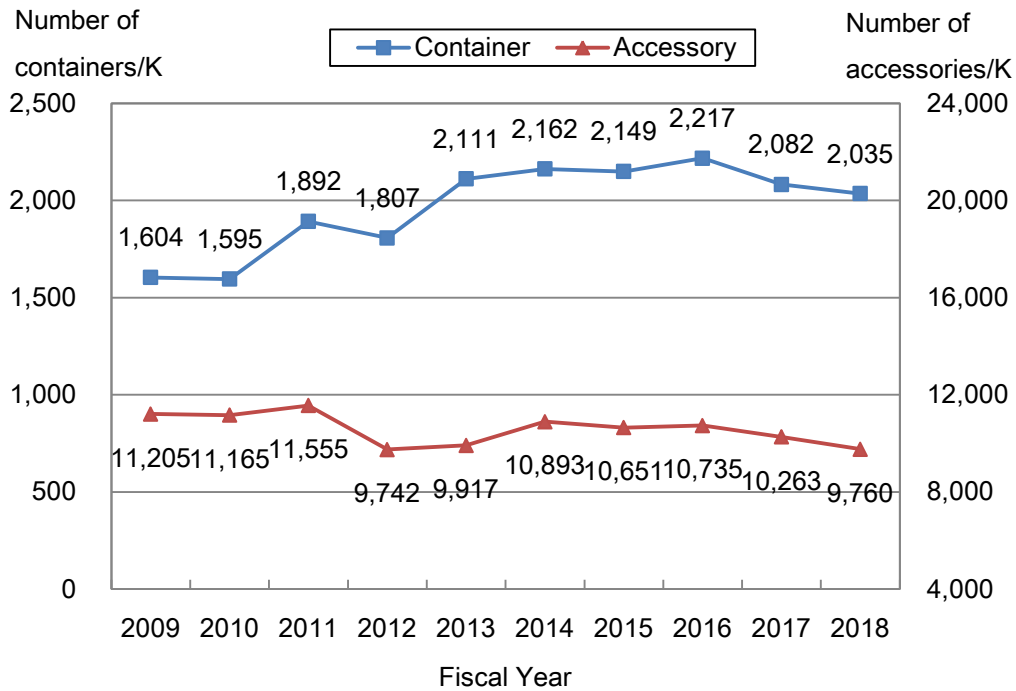
(a) Inspections for Pressure Equipment

The High Pressure Gas Safety Act stipulates that the person who has manufactured/ imported a container or accessory shall apply for the Container/Accessory Inspection. We at KHK conduct these inspections.

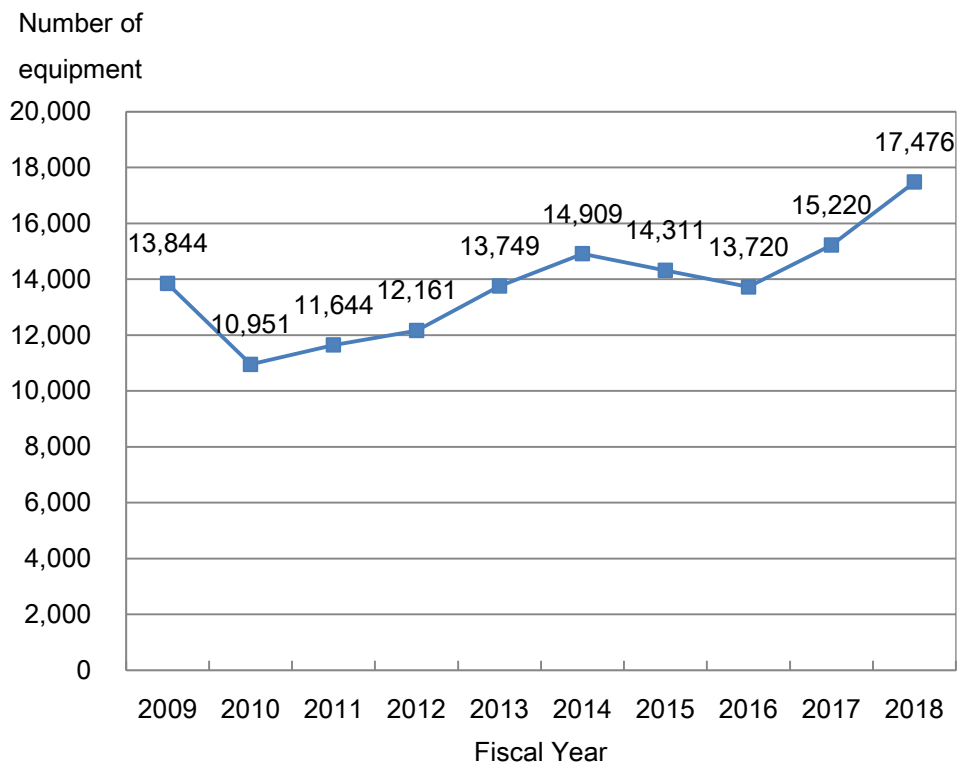
In addition, for preventing explosions or other accidents, the act defines "equipment for high pressure gas production (including storage tanks) "which particularly requires "inspections of its design, material quality, and the process of its manufacturing", as "Designated Equipment." KHK undertakes mandatory inspections of such Designated Equipment at each manufacturing process.

KHK undertakes technical assessments in advance to obtain Ministerial special approval, and also offers services for certification and examination as a part of its optional activities.

In fiscal 2018, the number of application for inspection of containers decreased by 2.3% and that of accessory equipment decreased by 4.9% compared to the previous fiscal year respectively. And the number of application for inspection of designated equipment increased by 14.8% compared to the previous fiscal year.



Number of Container/Accessory inspections



Number of Designated Equipment Inspections

(b) Pre-Assessment of Accredited Completion/ Safety Inspection Executor

This pre-assessment undertaken by KHK is part of the statutory service related to the Ministerial approval of accredited completion inspection executor and safety inspection executor.

Class 1 high pressure gas producers who obtained Ministerial approval as a result of this pre-assessment can replace completion inspections or safety inspections that are conducted by

prefectural or municipal governments with self-inspections by the approved producers themselves. When the self-inspections are conducted, the results shall be submitted to jurisdictional prefectural or municipal governments.

Number of pre-assessments

	2018	2017
Accredited completion inspection executor	15	18
Accredited safety inspection executor	16	19

(c) Safety Inspections of Refrigeration and Air-Conditioning Facilities

The number of inspections of refrigeration and air-conditioning facilities undertaken by KHK

	2018	2017
Completion inspection of refrigeration and air-conditioning facilities	36	42
Safety inspection of refrigeration and air-conditioning facilities	1,803	1,741
Approval of specified equipment (refrigeration equipment)	188	156
Transfer of specified equipment (refrigeration equipment)	2	6
Testing of refrigeration apparatus	307	104
Design strength verification test, etc.	150	113

3-3. Education

(a) Statutory Training

By the High Pressure Gas Safety Act, high pressure gas producers are required to establish a safety management team consisting of members with a designated high pressure gas production safety management certificate, depending on the type and scale of processing equipment and the type and volume of gas produced. To train certified personnel, KHK offers lectures on each certificate type, and retraining for existing members of safety management teams.

In addition, KHK also provides training courses for the following certificates: high pressure gas sales safety chiefs required at specified high pressure gas dealers, transportation supervisors required for transportation of specified amount of specified high pressure gas, and specific high pressure gas operation safety chiefs required for storage and consumption of specified high pressure gas beyond the designated capacity.

As for the LPG Law-related activities, KHK offers the following courses: training and retraining of LPG installation engineers for LPG piping facilities used for general consumption, retraining of retail operation chiefs, training and retraining of LPG filling operators, as well as training of safety operators and inspectors of facilities designed to consume LPG.

Number of applicants for statutory training

	2018	2017
Qualification Training	44,616	45,694
Re-training (Compulsory training)	46,544	45,643
Statutory training	91,160	91,337

Among the statutory training, while there was a decrease in the number of the qualification training from 45,694 in fiscal 2018 to 44,616, that of the re-training (compulsory training) increased from 45,643 to 46,544 in fiscal 2018. The total number of applicants of the statutory training decreased from 91,337 to 91,160.

(b) Other Training

During fiscal 2018, KHK held various seminars related to high pressure gas as below; on-site lectures corresponding to the needs of each business facility, safety seminars (such as basic lectures on high pressure gas and seminars on relevant law and regulations), seminars for high pressure gas safety executors (such as safety inspection seminars), and various seminars corresponding to the local needs.

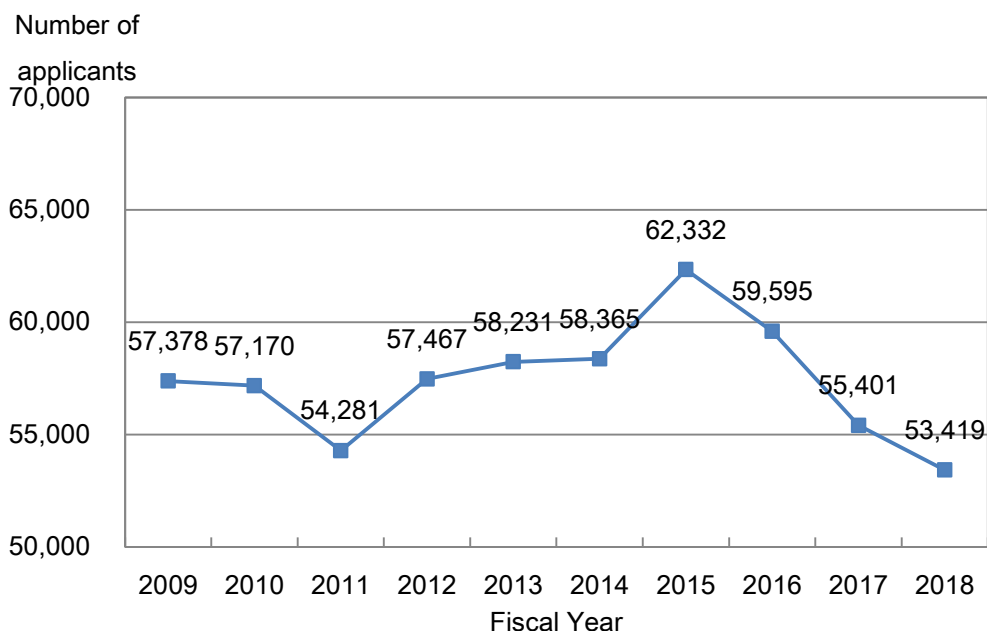
(c) Publications

KHK publishes books related to high pressure gas safety such as high pressure gas safety act, technical standards, and textbooks for training. During fiscal 2018, KHK published 143 types of books, accounting for a total of 172,527.

3-4. National Qualification Examination

The High Pressure Gas Safety Act and LPG Law stipulates that the Minister of Economy, Trade and Industry or prefectural governors must be responsible for conducting the high pressure gas production safety management examination, the high pressure gas sales safety chief examination, and the LPG installation engineer examination, depending on the classification of examinations.

However, the actual implementation of such examinations was transferred to KHK from the Minister of Economy, Trade and Industry and prefectural governors. The total number of applicants for such examinations in fiscal 2018 was 53,419, which was a decrease of 3.6% compared to 55,401 from the previous fiscal year.



Number of applicants for National qualification examinations

3-5. Research and Development

The Research and Development Center at KHK owns testing machines such as tensile/fatigue tests of materials, as well as hydraulic fatigue/explosion tests of pressure equipment including transportable containers, undertaking research and development to enhance high pressure gas safety. In addition,

KHK are working on researches commissioned by the government and incorporated administrative agencies.

In fiscal 2018, KHK conducted four studies commissioned by the Ministry of Economy, Trade and Industry as well as by the New Energy and Industrial Technology Development Organization (NEDO). The following is the overview of the research commissioned by NEDO.

(a) Technology Research and Development Project to Promote the Full-Scale Prevalence of Ultra High Pressure Hydrogen Infrastructure /Technological Development Related to Domestic Regulatory Optimization /Research and Development on the Introduction of New Criteria for Evaluatory Hydrogen Characteristics

Since general-purpose steel — the most common material in hydrogen stations across the city — is expected to be used, the following study was conducted for the purpose of introducing new evaluation standards for hydrogen characteristics; (1) Research and Development on Expansion of Usable Range of Stainless Steel, (2) Research and Development on Cold-Worked Material Stainless Steel, (3) Research and Development on Welding Materials for Stainless Steel, and (4) Research and Development on High Temperature Applications of Low Alloy Steel.

(b) Full-scale diffusion technology research and development project for Ultra-high pressure hydrogen infrastructure /Technological development related to cost reduction of hydrogen stations etc. /Development of evaluation method for composite pressure vessels, and technical development for the preparation of technical standards

The following two studies were conducted with the aim of simplifying the methods of evaluating composite pressure vessels, in order to reduce the cost of composite pressure vessels installed at the hydrogen stations, as well as to develop the technology to extend their service life; (1) Technological development for the establishment of composite pressure vessel design methods based on stress analysis and fatigue analysis, and (2) Technological development for the preparation of technical standards for composite pressure vessels.

3-6. Measures to Promote LPG Consumer Safety

(a) Liquefied Petroleum Gas Safety Commission

The commission operates with contributions from 17 LPG-related organizations and KHK. In partnership with the Gas Safety Office at METI Commerce, Distribution and Industrial Safety Policy Group, the commission performed the following safety campaigns during fiscal 2018.

- LPG Consumer Safety Campaign

Prepared and distributed LPG safety guides and posters, and advertised in magazines, while provided assistance to safety activities undertaken by prefectural LPG associations.

- LPG Consumer Safety Promotion Conference

At the event, the commission offered commendations for LPG retailers and related operators including individuals with the ‘METI Minister's Secretariat, Director-General for Commerce, Distribution and Industrial Safety Policy Award,’ ‘KHK Chairman’s Award,’ and ‘Liquefied Petroleum Gas Safety Commission President's Award,’ respectively.

(b) Examination

During fiscal 2018, the following examination activities were undertaken.

Examination activities

	2018	2017
LPG leak alarm examination and gas leak sensor	2,716,640	2,711,220
LPG incomplete combustion alarm examination	26,320	22,700
LPG sensor examination	1,890	1,911

3-7. Collection and Offering of Information, Technical Exchanges

(a) Collection of Accident Information

Acting on a commission by METI, KHK compiles a database of high pressure gas and LPG-related accidents and conduct a statistical analysis. See reference at the end of this brochure.

(b) Organization of Various Conferences and Conventions

The notable conferences and conventions KHK organized during fiscal 2018 include the following:

- Grand Conference of National Association of General High Pressure Gas Safety Organizations (Tokyo, August 2018)

The conference was organized for the purpose of fostering cooperation and discussions among general high pressure gas safety organizations established in prefectures. KHK acted as the administrative department for the conference.

- Seminar on Lessons from Accidents and Safety Management Technology

- ◆ Part of Safety Management Technology (Tokyo, July 2018 and Osaka, September 2018)

This seminar is for the accredited completion and safety inspection executors and the personnel of three management divisions (equipment, operation, and safety), including those at headquarters management level, of high pressure gas producers at industrial complexes, and it is organized to provide a place of information provision, information exchange, and discussions related to high pressure gas producing equipment, their operations, and safety management activities.

- ◆ Part of Lessons from Accidents and Safety Measures (Tokyo, August 2018 and Osaka, September 2018)

The high pressure gas producers that actually caused accidents explained their experience and post-accident efforts on safety measures so that seminar participants could make use of the information that would be helpful for their future voluntary safety activities, including lessons from accidents and preventive measures.

- National Conference of High Pressure Gas Safety (Tokyo, October 2018)

The conference, which takes place every October, is organized as a part of the annual high pressure gas safety promotion week, hosted by METI in conjunction with KHK. Each year, top-rated plants of safety, persons who have rendered distinguished safety service and excellent production safety managers are awarded in honor of their continuing hard work, support, and resulting outcomes in preventing high pressure gas-related accidents.

- High Pressure Gas Equipment Manager Meeting (Tokyo, October 2018)

The meeting is organized annually for the purpose of informing high pressure gas equipment personnel (applicants for Designated Equipment Inspection) of question and answers about material, design, welding, and structure-related issues in order to achieve consistent applications across varying issues.

- General Research Presentation (Tokyo, December 2018)

The presentation is hosted annually to disseminate information on the findings from the investigative research undertaken by the Research and Development Center at KHK.

(c) International Technical Exchange

KHK sends a delegate to the boiler and pressure vessel standards committee and the post-construction standards committee of the American Society of Mechanical Engineers (ASME), and also has established good relations with Korea Gas Safety Corporation and Industrial Safety and Health Association of the R.O.C.

3-8. Assessment and Registration System

(a) Assessment and Registration of Quality Management System

Since being accredited by the Japan Accreditation Board (JAB) as a quality management system certification body in 1994, the KHK ISO Registration Center (KH-ISO Center) evaluates quality management system for operators in accordance with the ISO 9000 series standards, and manages registration and publication of registered organizations. On June 2000, the Center started evaluating and managing registration and publication of registered organizations of the medical device quality management systems, which requires highly technical knowledge among quality management system based on ISO13485. As of the end of fiscal 2018, it performs registration in 30 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal 2018, the number of registrations stands at 774.

(b) Assessment and Registration of Environmental Management Systems

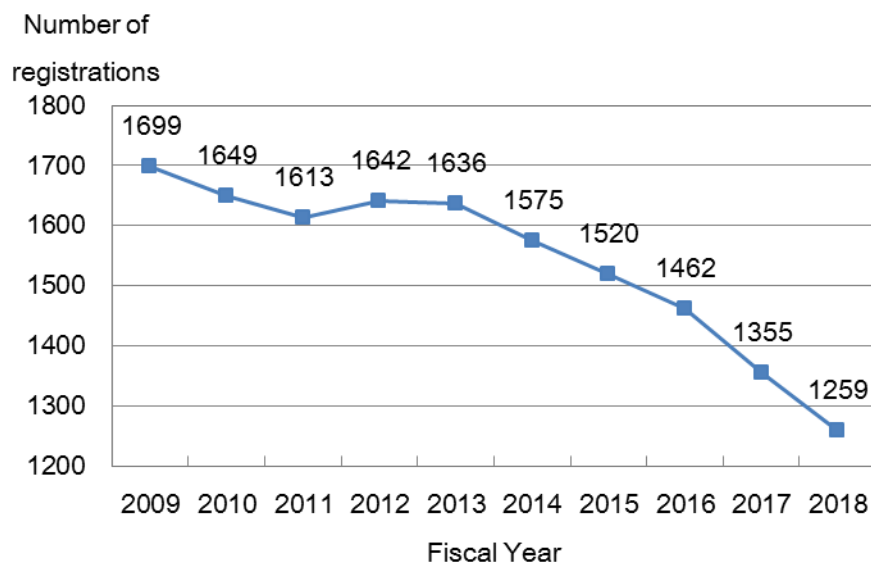
For assessment and registration of environmental management systems (ISO14001), the Center became a JAB- accredited certification body in 1996. As of the end of fiscal 2018, it operates registration screenings in 34 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal 2018, the number of registrations stands at 448.

(c) Assessment and Registration of Occupational Health and Safety Management Systems.

On March 2000, the Center began evaluating and managing registration and publication of registers for organizations of occupational health and safety management systems based on OSHA180001. In July 2018, the Center initiated management based on newly established ISO 45001. As of the end of fiscal 2018, the number of registrations stands at 24.

(d) Assessment and Registration of Food Safety Management Systems

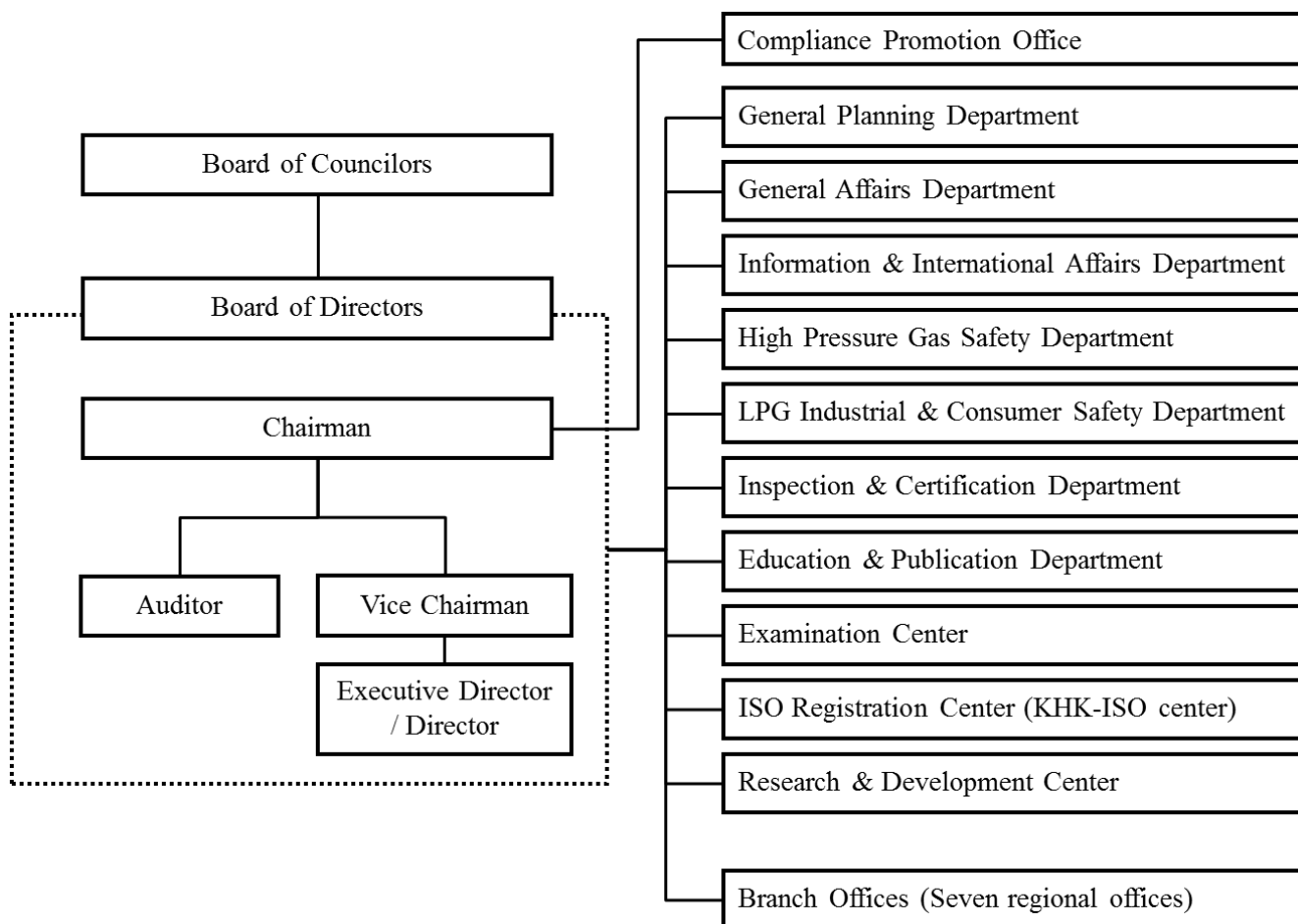
Taking advantage of the framework of quality management, environmental management, and occupational and health management systems, in 2011 the Center started managing registration and publication of registers of organizations based on ISO22000 series as a JAB-accredited body. As of the end of fiscal 2018, the number of registrations based on ISO 22000 stands at six and that based on FSSC22000 series stands at seven.



Change in the total number of registrations

4. Organization

4-1. Organization Chart



4-2. Membership Status

Types	March 31, 2019	March 31, 2018
Companies	868	868
Organizations	192	192
Individuals	85	96
Supporters	32	33

Reference: Overview of Accidents in Recent Years

Under the commission of METI, KHK records statistics of high pressure gas- and LPG-related accidents, based on the number of reports submitted in accordance with the regulatory requirements of the High Pressure Gas Safety Act (hereinafter referred to as “HPG Act”) and the Securing of Safety and the Optimization of Transaction of Liquefied Petroleum Gas (hereinafter referred to as “LPG Act”).

Figure 1 shows the number of the HPG Act accidents that occurred between 2009 and 2019 classified as human damages. Note that among the HPG accidents, the figure excludes those involving general consumers, which pertains to LPG Act.

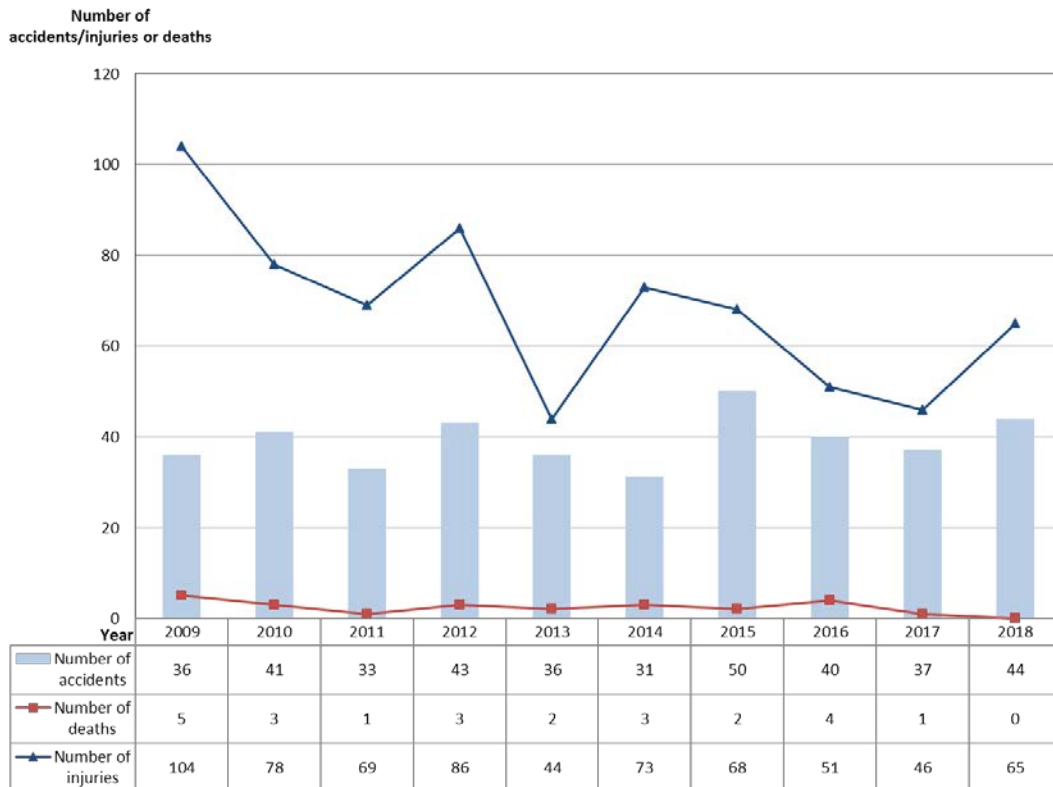


Figure 1: Change in number of HPG Act accidents classified as human damages

Figure 2 shows the LPG Act accidents that occurred between 2009 and 2018 classified as human damages. The total number of the LPG Act accidents classified as human damages is gradually decreasing. In 2018, no accident resulting death has occurred.

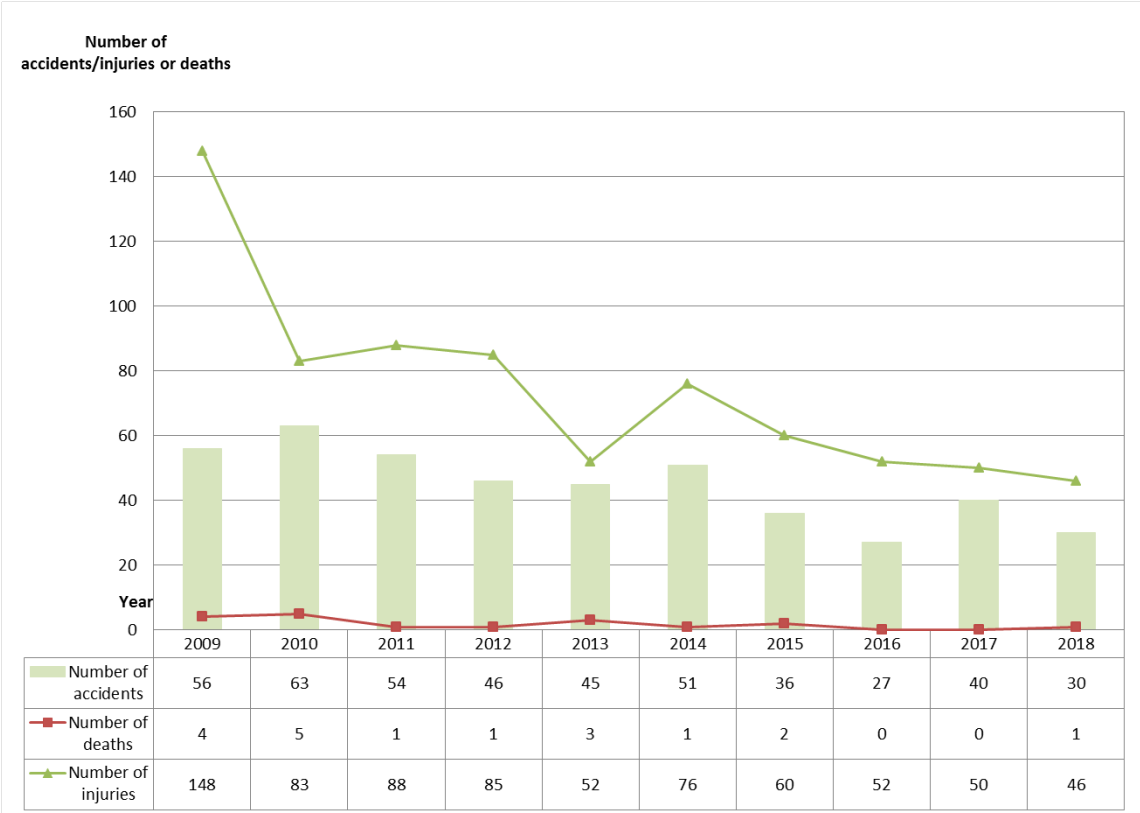


Figure 1: Change in number of the LPG Act accidents classified as human damages

Contact for inquiries related to this document

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