

Annual Report for Fiscal 2017

(April 1, 2017 - March 31, 2018)

The High Pressure Gas Safety Institute of Japan (KHK)

1. Business Environment and Overview of Operations

The slow recovery of the Japanese economy continued in fiscal 2017, against a backdrop of further improvements in the employment and income environments. On the other hand, various factors need to be taken into account when considering the outlook for overseas economies, such as the unpredictable Northeast Asian security situation, US policy trends, the risk of a downturn in business conditions in China, and the uncertainty accompanying Brexit, while attention to the impact of all these factors on the Japanese economy should be paid. Moreover, national disasters including torrential rain and typhoons have occurred in Japan, and continuous measures are needed.

Turning our attention to the field of high pressure gas safety, we assiduously carried out and stabilized the “fast track system” and “system for newly-accredited places of business”, which was initiated in earnest as a part of the smartification of high pressure gas safety promoted by the Ministry of Economy, Trade and Industry. Specifically, in terms of the fast track system, the assessment results of private standards implemented by KHK were publicized on our website in March 2018 as the first example of taking advantage the system, and in terms of the system for newly-accredited places of business, the Ministry of Economy, Trade, and Industry, based on a preliminary investigation by the KHK, implemented their first specific accreditation of places of business in December 2017, and the second in February 2018.

While we strengthen governance such as compliance and information security measures in view of our high public responsibility, our Research and Development Center equipped with the latest test equipment, was completed in July 2017, which led to the enhancement of the research implementation capacity which met the demands of the present age. Furthermore, we considered our future business management and promptly undertook the structural reforms.

Looking at the business environment of KHK in fiscal 2017: this year was the first year of cyclic increases in the number of students on legally-required courses; the number of requested tests for our Research and Development Center increased thanks to the new test equipment; the ISO Registration Center implemented in advance transition certification to the 2015-version standards, and we strived to reform structures, such as the creation of new business including holding new seismic seminars by collaboration among concerned departments, and the review of payment structures. As a result, we were able to secure a reasonable balance of payments.

2. Overview of Financial Statements for Fiscal 2017

(1) Balance Sheet

| Assets | (As of March 31, 2018) | |
|-------------------------|------------------------|-------------|
| | 2017 | 2016 |
| | Million Yen | Million Yen |
| Current assets | 1,627 | 1,481 |
| Fixed assets | 6,062 | 6,050 |
| Tangible fixed assets | 1,162 | 967 |
| Intangible fixed assets | 123 | 117 |
| Investments | 4,770 | 4,965 |
| Total | 7,688 | 7,532 |

| Liabilities/Capital | 2017 | 2016 |
|---------------------|-------------|-------------|
| | Million Yen | Million Yen |
| Current liabilities | 853 | 858 |
| Fixed liabilities | 1,957 | 2,092 |
| Reserve | 4,581 | 4,222 |
| Profit for the term | 298 | 358 |
| Total | 7,688 | 7,532 |

(2) Statement of Profit and Loss

| Expenditure | (from April 1, 2017 to March 31, 2018) | |
|-----------------------|--|-------------|
| | 2017 | 2016 |
| | Million Yen | Million Yen |
| Ordinary expenditure | 4,655 | 4,457 |
| Operating Expenditure | 4,655 | 4,457 |
| Extraordinary loss | 79 | 0 |
| Corporate taxes, etc. | 676 | 643 |
| Profit for the term | 298 | 358 |
| Total | 5,032 | 4,815 |

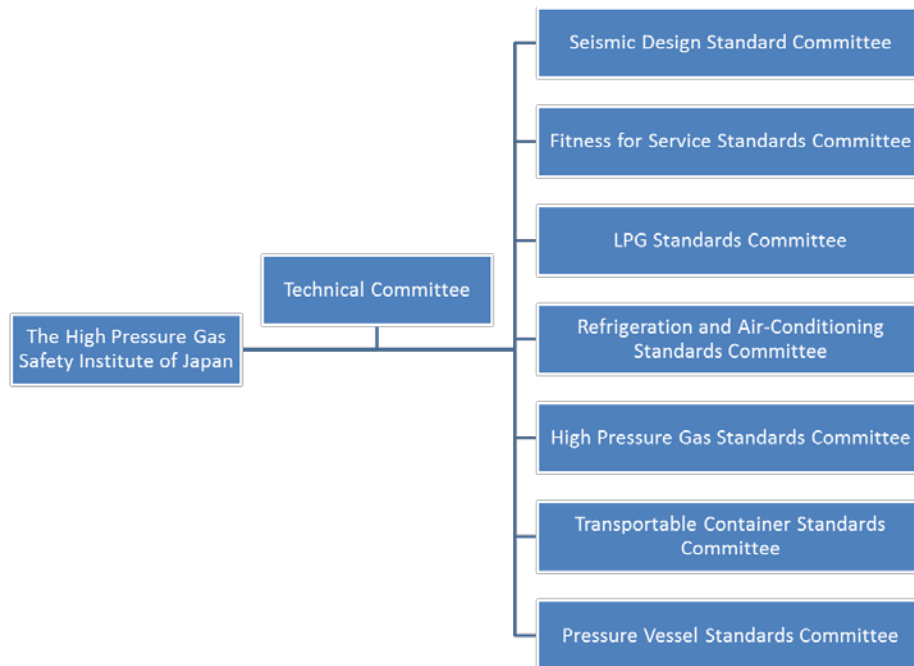
| Income | 2017 | 2016 |
|----------------------|-------------|-------------|
| | Million Yen | Million Yen |
| Ordinary income | 4,746 | 4,379 |
| Operating income | 4,624 | 4,269 |
| Non-operating income | 122 | 110 |
| Extraordinary income | 286 | 436 |
| Total | 5,032 | 4,815 |

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 president 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 2017, the following standards were established, reviewed or abolished.

(a) Newly Established Technical Standards

- Standard for in-service inspection (for LNG receiving terminal) (KHKS 0850-7)
- Periodical self-inspection guidelines (for LNG receiving terminal) (KHK/KLKS 1850-7)

(b) Revised Technical Standards

- Standard for test methods of prototype containers (KHKS 0123)
- Standard for welding repair of welded containers (KHKS 0180)
- Standard for inspection of bulk storage tank (KHKS 0745)
- Standard for inspection of bulk storage tank accessories (KHKS 0746)
- Standard for work prior to inspection of bulk storage tank and accessories (KHKS 0841)
- Safety education guideline for LPG sales operators (KHKS 1701)
- Standard for in-service inspection (for the General High Pressure Gas Safety Ordinance) (excluding stand and cold evaporator) (KHKS 0850-1)
- Standard for in-service inspection (for the Liquefied Petroleum Gas Safety Ordinance) (excluding stand) (KHKS 0850-2)

- Standard for in-service inspection (for the Industrial Complex Safety Ordinance) (excluding stand and cold evaporator) (KHKS 0850-3)
- Standard for in-service inspection (for natural gas stand) (KHKS 0850-5)
- Standard for in-service inspection (for liquefied petroleum gas stands) (KHKS 0850-6)
- Standard for in-service inspection (for LNG receiving terminal) (KHKS 0850-7)
- Periodical self-inspection guidelines (for the General High Pressure Gas Safety Ordinance) (excluding stand and cold evaporator) (KHKS 1850-1)
- Periodical self-inspection guidelines (for the Liquefied Petroleum Gas Safety Ordinance) (excluding stand) (KHKS 1850-2)
- Periodical self-inspection guidelines (for the Industrial Complex Safety Ordinance) (excluding stand and cold evaporator) (KHKS 1850-3)
- Periodical self-inspection guidelines (for natural gas stand) (KHKS 1850-5)
- Periodical self-inspection guidelines (for liquefied petroleum gas stand) (KHKS 1850-6)

(c) Abolished Technical Standards

- Standard for low pressure rubber hose for indoor use with quick joint at both ends for liquefied petroleum gas (KHKS 0717)

3-2. Inspection, Examination and Accreditation

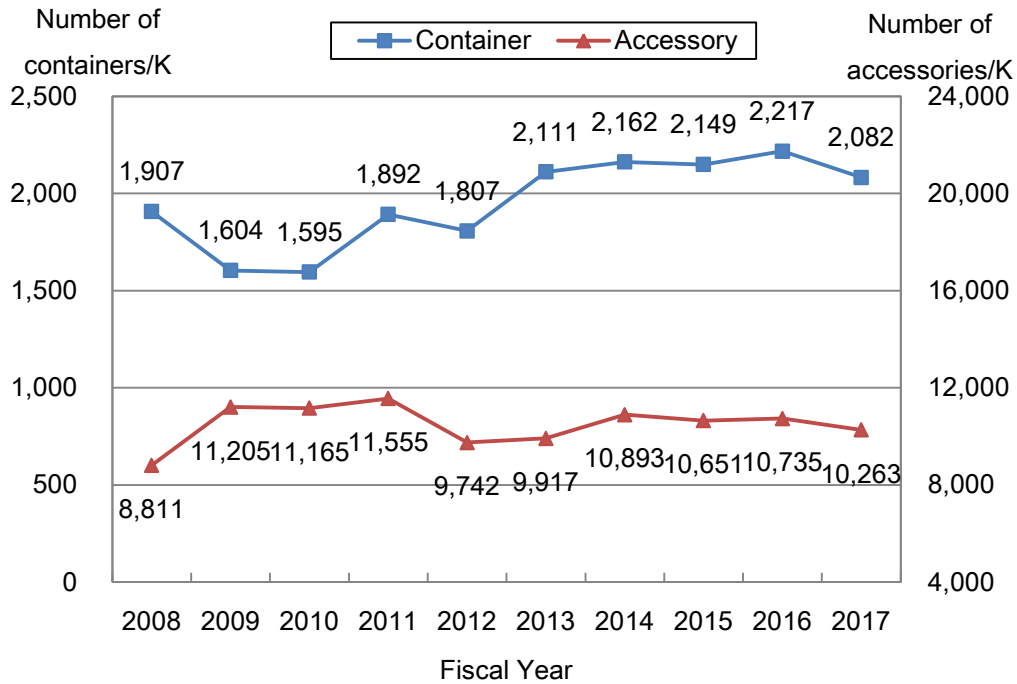
(a) Inspections for Pressure Equipment

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.

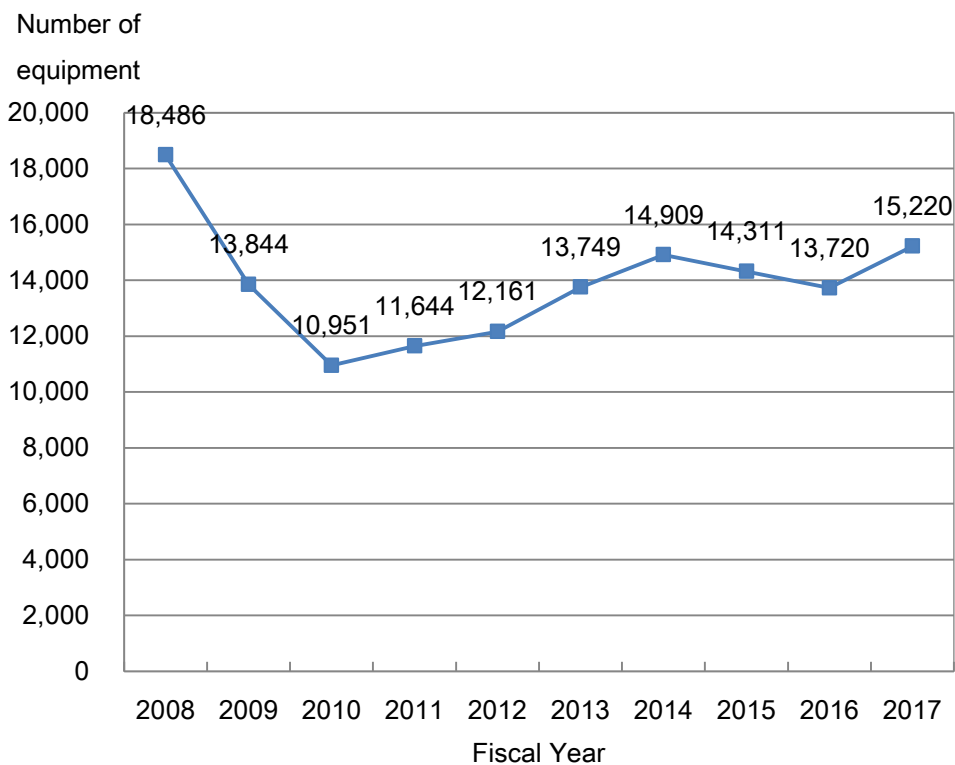
In addition, for preventing explosions or other accidents, the act defines "equipment for high pressure gas production (including storage tanks) "which particularly requires "inspections of its design, material quality, and the process of its manufacturing", as "Designated Equipment." KHK undertakes 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 2017, the number of application for inspection of containers decreased by 6.1% and that of accessory equipment decreased by 4.4% compared to the previous fiscal year respectively. And the number of application for inspection of designated equipment increased by 10.9% 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

| | 2017 | 2016 |
|---|------|------|
| Accredited completion inspection executor | 18 | 20 |
| Accredited safety inspection executor | 19 | 20 |

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

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

| | 2017 | 2016 |
|--|-------|-------|
| Completion inspection of refrigeration and air-conditioning facilities | 42 | 80 |
| Safety inspection of refrigeration and air-conditioning facilities | 1,741 | 1,804 |
| Approval of specified equipment (refrigeration equipment) | 156 | 160 |
| Transfer of specified equipment (refrigeration equipment) | 6 | 5 |
| Testing of refrigeration apparatus | 104 | 158 |
| Design strength verification test, etc. | 113 | 155 |

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

| | 2017 | 2016 |
|-----------------------------------|--------|--------|
| Qualification Training | 45,694 | 44,464 |
| Re-training (Compulsory training) | 45,643 | 32,416 |
| Statutory training | 91,337 | 76,880 |

Among the statutory training, while there was a decrease in the number of the qualification training from 44,464 in fiscal 2017 to 45,694, that of the re-training (compulsory training) increased from 32,416 to 45,643 in fiscal 2017. The total number of applicants of the statutory training increased from 76,880 to 91,337.

(b) Other Trainings

During fiscal 2017, KHK held periodical seminars including basic lectures on high pressure gas safety (14types at 44 locations), and organized 24 on-site lectures on voluntary safety activities depending on the needs of each business facility.

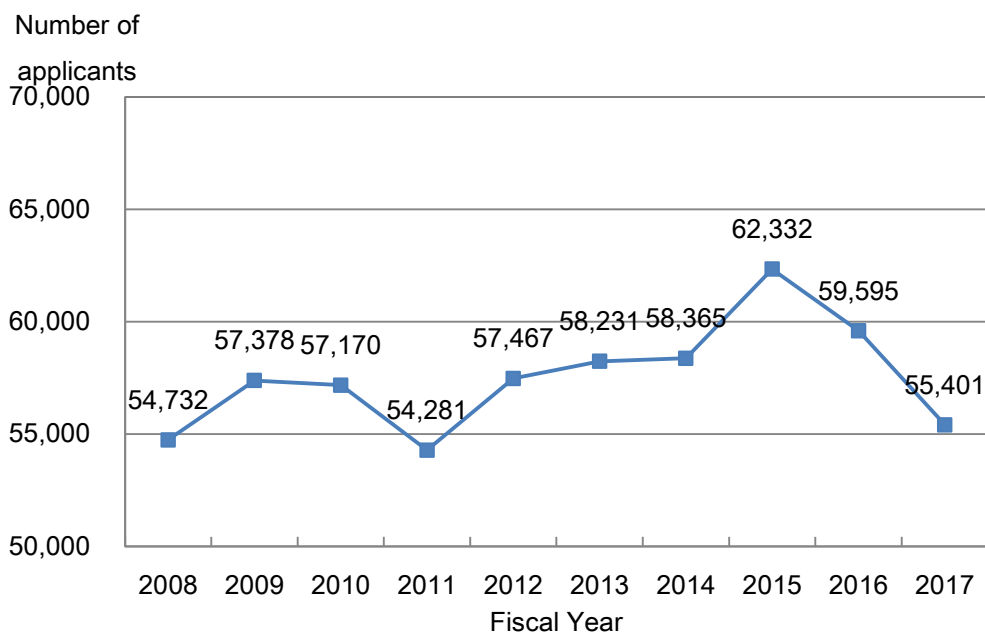
(c) Publications

KHK publishes books related to high pressure gas safety such as high pressure gas safety act, technical standards, and textbooks for training. During fiscal 2017, KHK published 139 types of books, accounting for a total of 154,420.

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 2017 was 55,401, which was a decrease of 7.0% compared to 59,595 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 2017, KHK conducted five researches 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.

“Investigation and Research on Fuel Cell Vehicles and the Optimization of Domestic Regulations and International Harmonization and Standardization of Hydrogen Supply Infrastructure”

(a) Research and Development on the Diversification of the Types of Metal Materials for Hydrogen Fueling Stations

In preparation for the advent of the hydrogen society, it is intended to build up an environment, which will allow the selection of reasonable, easy and convenient materials at temperatures and pressures desired for the construction of a hydrogen station, and gain experience by practice. It is also aimed to study and determine the criteria to evaluate availability of materials in hydrogen stations, including test types, conditions, evaluation methods and the like, and standardize these techniques and widen the range of usable materials.

(b) Research and Development on the Standardization of Composite Cylinders and Tubes for Stationary Storage

In the testing of composite cylinders and tubes which are used in hydrogen stations, there is a big gap between an ambient temperature pressure cycling test, one of the evaluation methods, and actual use conditions. A further sophistication of the evaluation methods, including the fatigue design of composite cylinders and tubes, is desired. Under the circumstances, it is aimed to improve and sophisticate (1) the evaluation techniques of Composite Cylinders and Tubes for Stationary Storage, (2) the evaluation techniques of CFRP, (3) the fatigue design methods of Composite Cylinders and Tubes for Stationary Storage and (4) the safety inspection techniques of composite cylinders and tubes, in order to contribute to the research and development for the standardization of composite cylinders and tubes for hydrogen stations.

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 2017.

- 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 President's Award,’ and ‘Liquefied Petroleum Gas Safety Commission President's Award,’ respectively.

(b) Examination

During fiscal 2017, the following examination activities were undertaken.

Examination activities

| | 2017 | 2016 |
|--|-----------|-----------|
| LPG leak alarm examination and gas leak sensor | 2,711,220 | 2,763,618 |
| LPG incomplete combustion alarm examination | 22,700 | 28,039 |
| LPG sensor examination | 1,911 | 1,930 |

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 2017 include the following:

- Grand Conference of National Association of General High Pressure Gas Safety Organizations (Tokyo, July 2017)

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 (Tokyo and Osaka, August 2017)

- ◆ Part of Safety Management Technology

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

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 2017)

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 (Kyoto, October 2017)

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 2017)

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.

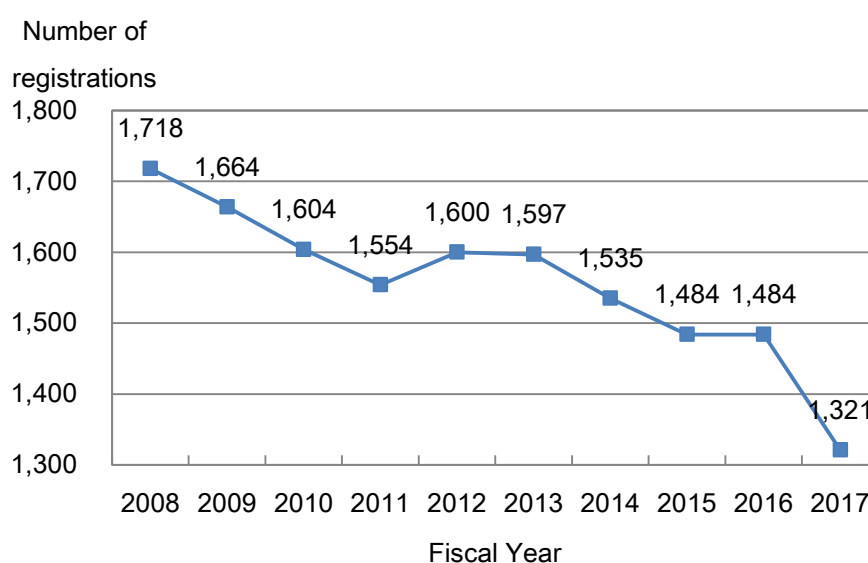
3-8. Assessment and Registration System

(a) Assessment and Registration of Quality Management Systems

Since being accredited by the Japan Accreditation Board (JAB) as a quality management system certification body in 1994, KHK ISO Registration Center (KHK-ISO Center) handles registration of quality management systems for operators in accordance with the ISO9000 series standards, and manages registration and publication of registered organizations. As of the end of fiscal 2017, it operates registration in 30 out of 39 class JAB accredited (class 1-39). As of the end of fiscal 2017, the number of registrations stands at 832.

(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, and as of the end of fiscal 2017, it operates registration screenings in 34 out of 39 JAB-accredited classes (class 1-39). As of the end of fiscal 2016, the number of registrations stands at 489.



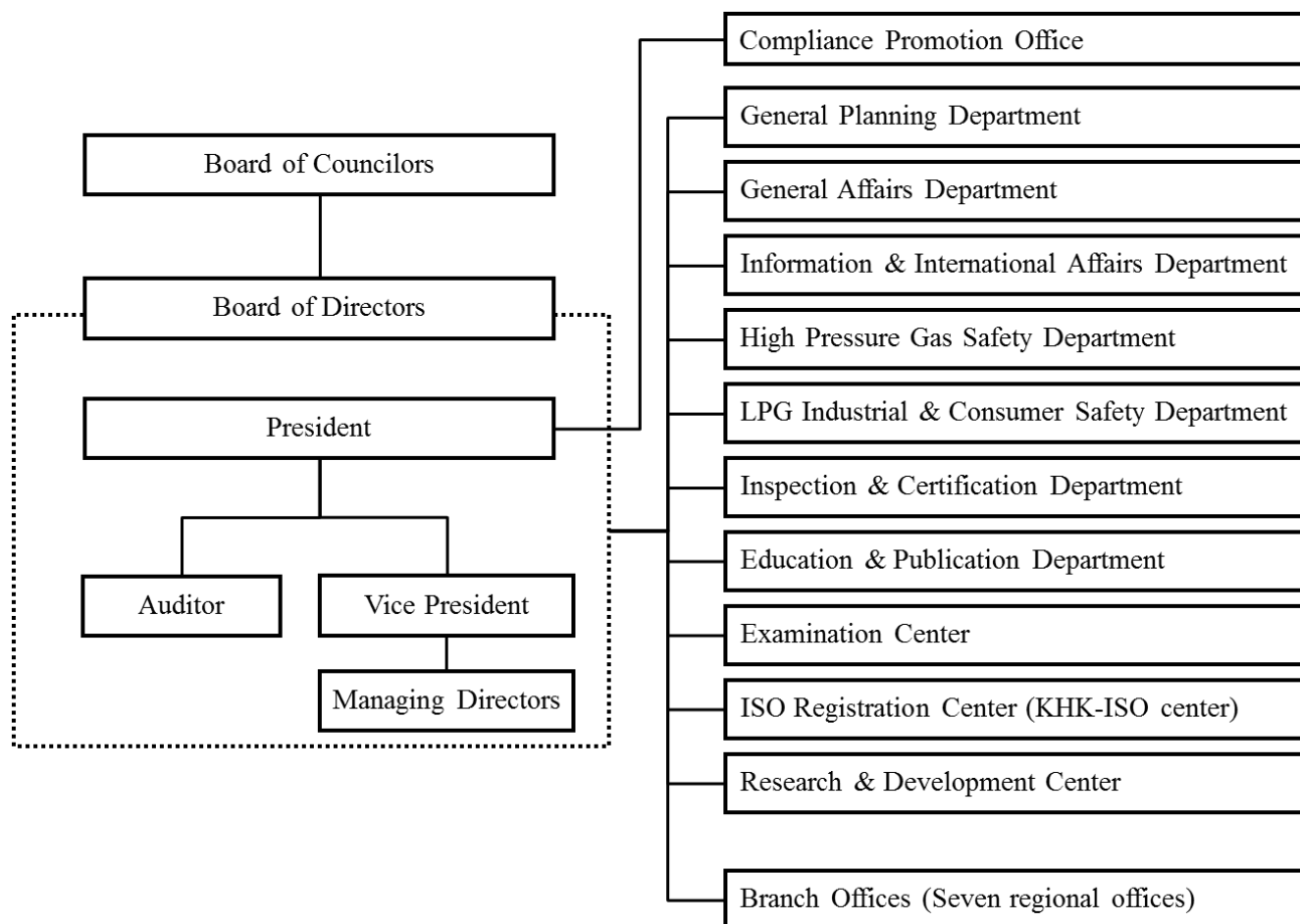
Change in the total number of registrations (Quality and Environment)

(c) Other Assessment and Registration

As of the end of fiscal 2017, the total number of occupational health and safety management system (OHSMS) registrations was 26. The total number of food safety management system (ISO22000) registrations was five, and the total number of FSSC22000 series was six.

4. Organization

4-1. Organization Chart



4-2. Membership Status

| Types | March 31, 2018 | March 31, 2017 |
|---------------|----------------|----------------|
| Companies | 868 | 871 |
| Organizations | 192 | 192 |
| Individuals | 96 | 92 |
| Supporters | 33 | 32 |

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 2008 and 2017 classified as human damages. Note that among the HPG accidents, the figure excludes those involving general consumers, which pertains to LPG Act.

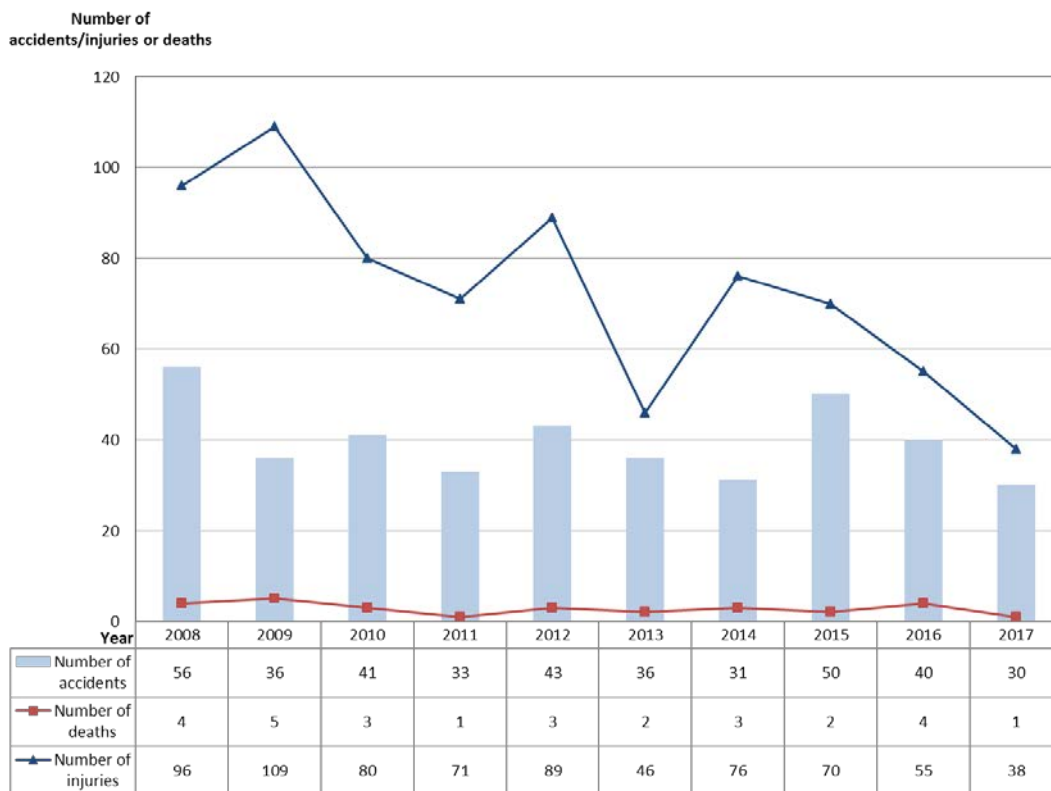


Figure 1: Change in number of HPG Act accidents classified as human damages

Figure 2 shows the LPG Act accidents that occurred between 2008 and 2017 classified as human damages. The total number of the LPG Act accidents classified as human damages is gradually decreasing. In 2017, no accident resulting death has occurred.

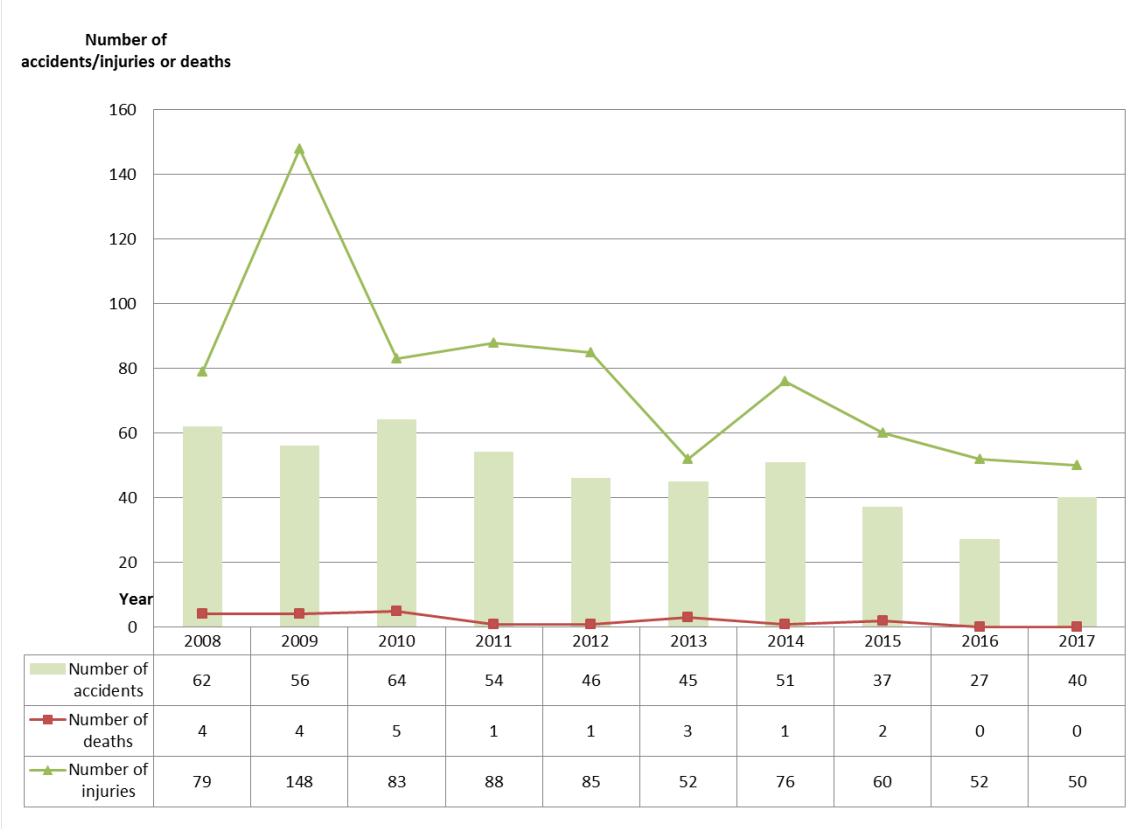


Figure 1: Change in number of the LPG Act accidents classified as human damages

Contact for inquiries related to this document

The High Pressure Gas Safety Institute of Japan (KHK)



Information & International Affairs Department

International Affairs Division

4-3-13 Toranomom, Minato-ku, Tokyo 105-8447

TEL: +81-3-3436-2201 FAX: +81-3-3438-4163

Web: <http://www.khk.or.jp/english/index.html>

MAIL: oversea@khk.or.jp