

Annual Report for Fiscal 2022

(April 1, 2022 - March 31, 2023)

The High Pressure Gas Safety Institute of Japan (KHK)

1. Business Environment and Overview of Operations

The Japanese economy maintains a moderate recovery trend, reflecting the normalization of social and economic activities after the Covid-19 pandemic.

On the other hand, the environment surrounding the Japanese economy is becoming increasingly severe due to soaring global energy and food prices as well as monetary restraint in America and Europe.

It is necessary to pay close attention to the risks of a downturn in foreign economies and influences of price increases and supply-side constraints.

In addition, there was large-scale damage from landslides and floods caused by torrential rain in the Tohoku and Hokuriku region in August 2022 and the rain storms by typhoons No.14 and No.15 which hit the Kyushu region and the Pacific coastlines of the East Japan side respectively in September 2022.

As natural disasters have become more severe and frequent in Japan in recent years, and continual response to these events has been required.

Turning to the field of high pressure gas safety, the High Pressure Gas Safety Act was revised in June 2022 to establish a new accreditation system that promotes smart safety as a response to the development of innovative technology in the industrial safety field and the shortage of the safety-involved human resources.

Currently, the detailed design of the system is being considered for the start of the system scheduled for December 2023.

Under these circumstances, governance such as compliance and information security measures were strengthened in view of the high public responsibility of KHK. KHK also implemented internal reorganization in order to respond flexibly to new technologies, systems, and industrial needs in consideration of the future management situation.

Specifically, the former nine different departments of the organization excluding Compliance Office and ISO Registration Center were consolidated by function and divided into four new departments as below, to eliminate overlap and to unify similar operations.

- General Affairs and Planning Dept.: Planning and management coordination, and administration
- Safety and Technology Dept.: Safety technologies related to high pressure gas and liquefied petroleum gas
- Inspection and Certification Dept.: Inspection, certification and evaluation related to facilities and equipment
- Examination and Education Dept.: Management of national qualifying examinations and statutory qualification training courses and other educational businesses

In order to respond more proactively and swiftly to the social implementation of hydrogen from both safety and promotion perspectives, the Hydrogen Safety and Development Center was created in January 2023, by radically strengthening the Hydrogen Team established in February 2021.

KHK is also promoting the digitalization of business operations to improve convenience to customers and streamlined operations. As e-commerce site and sales management system has also been introduced to accept orders for publications and applications for seminars.

Additionally, a system was developed that accepts online applications for inspections and other services on website.

As a result, we kept balance of earning and expense of our business in fiscal 2022, because it was the first year when the number of students of statutory qualification training courses increases periodically, and that we have made significant cuts in labor and operating costs in recent years by streamlining of operations through digital technology usages and reorganization.

2. Overview of Financial Statements for Fiscal 2022

(1) Balance Sheet

Assets	(As of March 31, 2023)	
	2022 Million Yen	2021 Million Yen
Current assets	3,775	3,680
Fixed assets	4,995	4,498
Tangible fixed assets	936	960
Intangible fixed assets	285	270
Investments	3,774	3,268
Total	8,770	8,177
Liabilities/Capital	2022 Million Yen	2021 Million Yen
Current liabilities	1,003	724
Fixed liabilities	2,725	2,440
Reserve	5,013	4,943
Profit for the term	29	70
Total	8,770	8,177

(2) Statement of Profit and Loss

Expenditure	(From April 1, 2022 to March 31, 2023)	
	2022 Million Yen	2021 Million Yen
Ordinary expenditure	4,661	4,374
Operating expenditure	4,661	4,374
Extraordinary loss	0	1
Corporate taxes, etc.	1	1
Profit for the term	29	70
Total	4,691	4,446
Income	2022 Million Yen	2021 Million Yen
Ordinary income	4,691	4,428
Operating income	4,633	4,354
Non-operating income	57	74
Extraordinary income	0	18
Total	4,690	4,446

3. Overview of Each Activity

3-1. Inspection, Examination and Accreditation

(a) 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

	2022	2021
Accredited completion inspection executor	14	18
Accredited safety inspection executor	15	20
Super accredited completion inspection executor	0	5
Super accredited safety inspection executor	1	8

(b) Inspections for Pressure Equipment

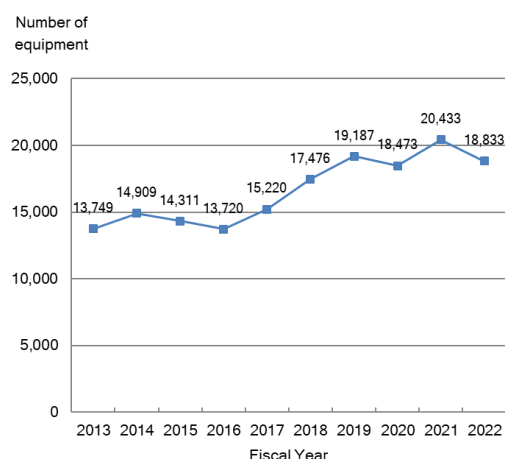
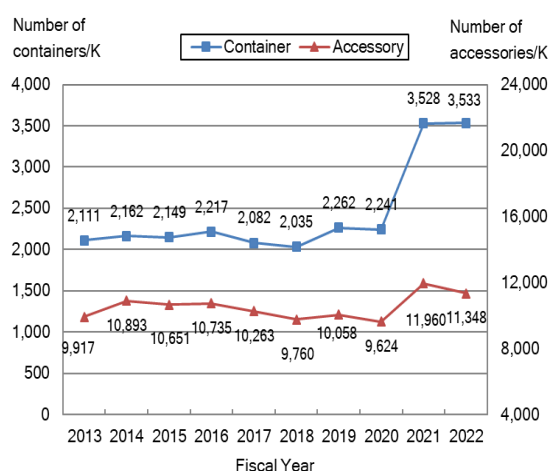
The High Pressure Gas Safety Act (hereinafter referred to as "HPG Act") stipulates that the person who has manufactured/ imported a container or accessory shall apply for the Container/Accessory Inspection. We at KHK conduct these inspections.

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 2022, the number of application for inspection of containers increased by 0.14% and that of accessory equipment decreased by 5.1% compared to the previous fiscal year respectively. And the number of application for inspection of Designated Equipment decreased by 7.8% compared to the previous fiscal year.



Number of Container/Accessory inspections

Number of Designated Equipment Inspections

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

Number of inspections of refrigeration and air-conditioning facilities undertaken by KHK

	2022	2021
Completion inspection of refrigeration and air-conditioning facilities	24	46
Safety inspection of refrigeration and air-conditioning facilities	1,497	1,554
Approval of specified equipment (unit type refrigeration equipment)	113	105
Transfer of specified equipment (unit type refrigeration equipment)	0	7
Testing of refrigeration apparatus	250	320
Design strength verification test, etc.	89	158

(d) Examination of Liquefied Petroleum Gas (hereinafter referred to as "LPG") alarm, etc.

Number of examination

	2022	2021
LPG leak alarm and Bulk gas leak sensor	2,539,381	2,721,354
LPG incomplete combustion alarm	27,099	20,180
LPG sensor	1,790	1,740

3-2. Education

(a) Seminars

During fiscal 2022, 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.

(b) Publications

KHK publishes books related to high pressure gas safety such as HPG Act, technical standards, and textbooks for training. During fiscal 2022, KHK published 145 types of books, accounting for a total of 160,861.

3-3. 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. In 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 2022, it performs registration in 31 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal 2022, the number of registrations stands at 744.

(b) Assessment and Registration of Environmental Management Systems

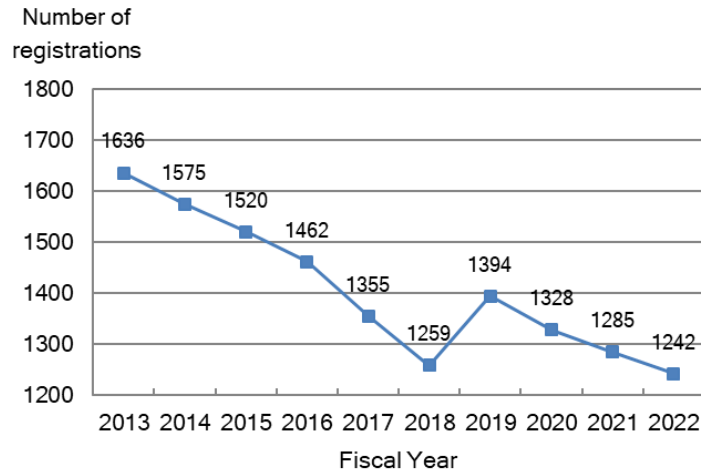
For assessment and registration of environmental management systems (ISO14001), the Center became a JAB-accredited certification body in 1996. As of the end of fiscal 2022, it operates registration screenings in 34 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal 2022, the number of registrations stands at 463.

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

In March 2000, the Center began evaluating and managing registration and publication of registers for organizations of occupational health and safety management systems based on OSHA18001. In July 2018, the Center initiated management based on newly established ISO 45001. As of the end of fiscal 2022, the number of registrations stands at 29.

(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 2022, the number of registrations based on ISO 22000 stands at 6. Certification of food safety management systems based on FSSC22000 which started in FY2013 was terminated at the end of FY2021 due to the contract with the scheme owner, the FSSC Foundation:



Change in the total number of registrations

3-4. Measures to Promote LPG Consumer Safety

The Liquefied Petroleum Gas Safety Commission operates with contributions from 17 LPG-related organizations, 4 related ministries/agencies, 2 consumer organizations and KHK. In partnership with the Gas Safety Office of Commerce, Distribution and Industrial Safety Policy Group, METI, the commission performed the following safety campaigns during fiscal 2022.

(a) 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.

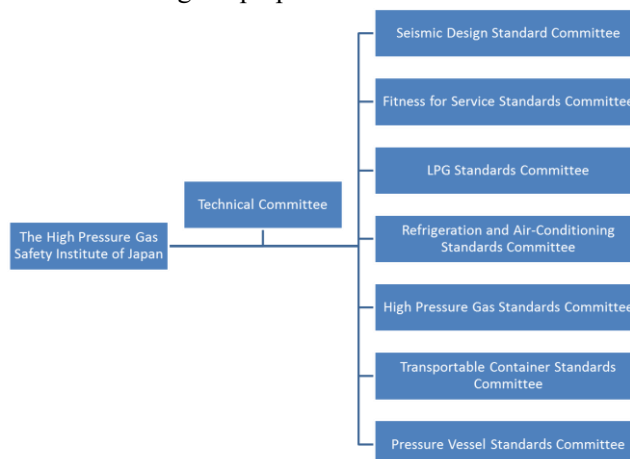
(b) LPG Consumer Safety Promotion Conference

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.

3-5. 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 2022, the following standards were confirmed and revised.

(a) Revised Technical Standards

- Standard for Safety Valve of Liquefied Carbon Dioxide Container(KHKS 0127)
- Standard for Repair Welding of Welded Pressure Vessels (KHKS 0180)
- Standard for Bulk Supply of Liquefied Petroleum Gas (KHKS 0501)
- Standard for Hoses with Combustor Connectors for LPG (KHKS 0721)
- 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 Specifying the Next Inspection Time of Pressure Resistance and Strength based on Fitness-for-Service Evaluation of High Pressure Facilities (KHK/PAJ/JPCAS 0851)
- Safety Education Guideline for LPG Sales Operators (KHKS 1701)
- Guideline of Safety Training Program for Class 1 Producer and Specific Plant (KHKS 1801-1)
- Guideline of Safety Training Program for Class 1 Producer and General Plant (KHKS 1801-2)
- Safety Education Guideline for Class 2 Producer, Owner or Possessor of a Class 1 Storage Place or Class 2 Storage Place, Dealer, or Specific High Pressure Gas Consumer (KHKS 1801-3)

(b) Abolished technical standards

- Guideline of Earthquake Disaster Prevention Rule (for Refrigeration-related Business Establishments) (KHKS 1302)
 - Guideline of Earthquake Disaster Prevention Rule (for Specific Business Establishments)(KHKS 1802-1)
 - Guideline of Earthquake Disaster Prevention Rule (for General Business Establishments) (KHKS 1802-2)
 - Guideline of Disaster Prevention Rule of Nankai Trough Earthquake (for Refrigeration-related Business Establishments)(KHKS 1303)
 - Guideline of Disaster Prevention Rule of Nankai Trough Earthquake (for Specific Business Establishments) (KHKS 1803-1)
 - Guideline of Disaster Prevention Rule of Nankai Trough Earthquake (for General Business Establishments) (KHKS 1803-2)
 - Guideline of Disaster Prevention Rule of Subduction Zone Earthquake around Japan Trench and Chishima Trench (for Refrigeration-related Business Establishments) (KHKS 1304)
 - Guideline of Disaster Prevention Rule of Subduction Zone Earthquake around Japan Trench and Chishima Trench (for Specific Business Establishments)(KHKS 1804-1)
 - Guideline of Disaster Prevention Rule of Subduction Zone Earthquake around Japan Trench and Chishima Trench (for General Business Establishments)(KHKS 1804-2)
- Note: Three types of guidelines: (i)Guideline of Earthquake Disaster Prevention Rule, (ii)Guideline of Disaster Prevention Rule of Nankai Trough Earthquake and (iii)Guideline of Disaster Prevention Rule of Subduction Zone Earthquake around Japan Trench and Chishima Trench were incorporated as annexes in Guidelines for Hazard Prevention Regulations.
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type II) (KHKS 0726)
 - Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for

- LPG (Type L) (KHKS 0728)
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type S) (KHKS 0733)
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type SB) (KHKS0737)
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type E and EB) (KHKS0741)
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type S4) (KHKS0742)
- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (Type E4)(KHKS0743)

Note: Each type of the standards related to automatic gas shutoff devices with microcomputer-based flow rate detection for LPG was merged into the Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (KHKS 0751) . Please note that standard of Type II and Type L were not included in the new unified standard because they have not produced for around 10 years and will not be produced in the future according to the related organizations.

(c) Newly established technical standards

- Standard for Bellows Expansion Joints (KHKS 0804)
- Standard for Flexible Tubes (KHKS 0805)

Note: The standard related to flexible tube (KHKS0803) was divided into the two new standards to clarify the difference of the usage between joints and tube.

- Standard for Automatic Gas Shutoff Devices with Microcomputer-based Flow Rate Detection for LPG (KHKS 0751)

3-6. Statutory Training (Special Account 1)

By HPG 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 activities related to the Act on the Securing of Safety and the Optimization of Transaction of Liquefied Petroleum Gas (hereinafter referred to as “LPG Act”), 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.

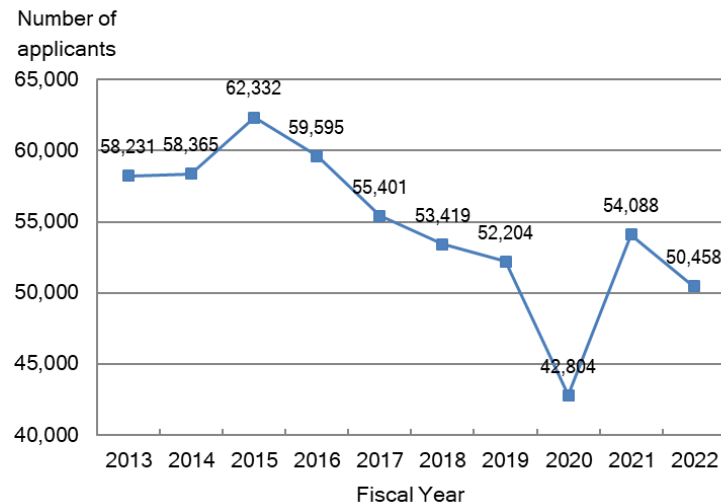
Number of applicants for statutory training

	2022	2021
Qualification Training	42,209	39,611
Re-training (Compulsory training)	42,535	33,133
Total of Statutory training	84,744	72,744

3-7. National Qualification Examination (Special Account 2)

HPG Act and LPG Act stipulate 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 2022 was 50,458, which was a decrease of 6.7% compared to 54,088 from the previous fiscal year.



Number of applicants for National qualification examinations

3-8. Research & Development and Commissioned Studies

(a) The Research and Development Center

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 (see (b) (5) (6) below).

In fiscal 2022, the Center conducted 17 studies commissioned by private companies, etc.

(b) Commissioned Studies

KHK conducted the following studies commissioned by the government, etc.

(1) Security measures related to oil and gas supply (i)

- Study on the implementation of legal training related to high pressure gas safety
- Research and study for further advancement of seismic design methods for high pressure gas equipment
- Accident information survey of oil refining plants, etc.
- Survey of technological trends of the latest cited standards for example standards for Class 2 designated equipment in Designated Equipment Inspection Regulations
- Study on a new accreditation system of the high pressure gas

(2) Advanced security regulations for new energy, etc.

- Development of high pressure gas technical standard for the safe dissemination of new energy technologies, etc.
- Study on safe use of low GWP refrigerant in freezing equipment

- (3) Security measures related to oil and gas supply (ii)
 - Safety technology dissemination
 - Study on LPG safety regulations
- (4) Promotion of 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
- (5) 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
- (6) Operation performance confirmation and examination work such as security inspections related to the petroleum gas bedrock storage bases
- (7) Research and development project for development of the industrial safety technical standard
 - Training and awards on high pressure gas safety
 - Study on the reviews of regulations related to high pressure gas containers
- (8) Examination work for de-carbonization of the national petroleum storage bases

3-10. 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 the reference at the end of this brochure.

(b) Organization of Various Conferences and Conventions

The notable conferences and conventions KHK organized during fiscal 2022 include the following:

- Grand Conference of National Association of General High Pressure Gas Safety Organizations (Tokyo, September 2022)

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 secretariat for the conference.

- Seminar on Lessons from Accidents and Safety Management Technology

This seminar is held at the venues as well as delivered online live and on demand.

- ◆ Part of Safety Management Technology (Tokyo, October 2022)

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, October 2022)

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 2022)

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, November 2022)

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.

- Hydrogen Seminar (Online on demand, March 2023)

The seminar was organized to provide hydrogen-related people with a wide range of the latest trends in hydrogen, including institutional and technical aspects, in view of the realization of a hydrogen-based society.

(c) International Technical Exchange

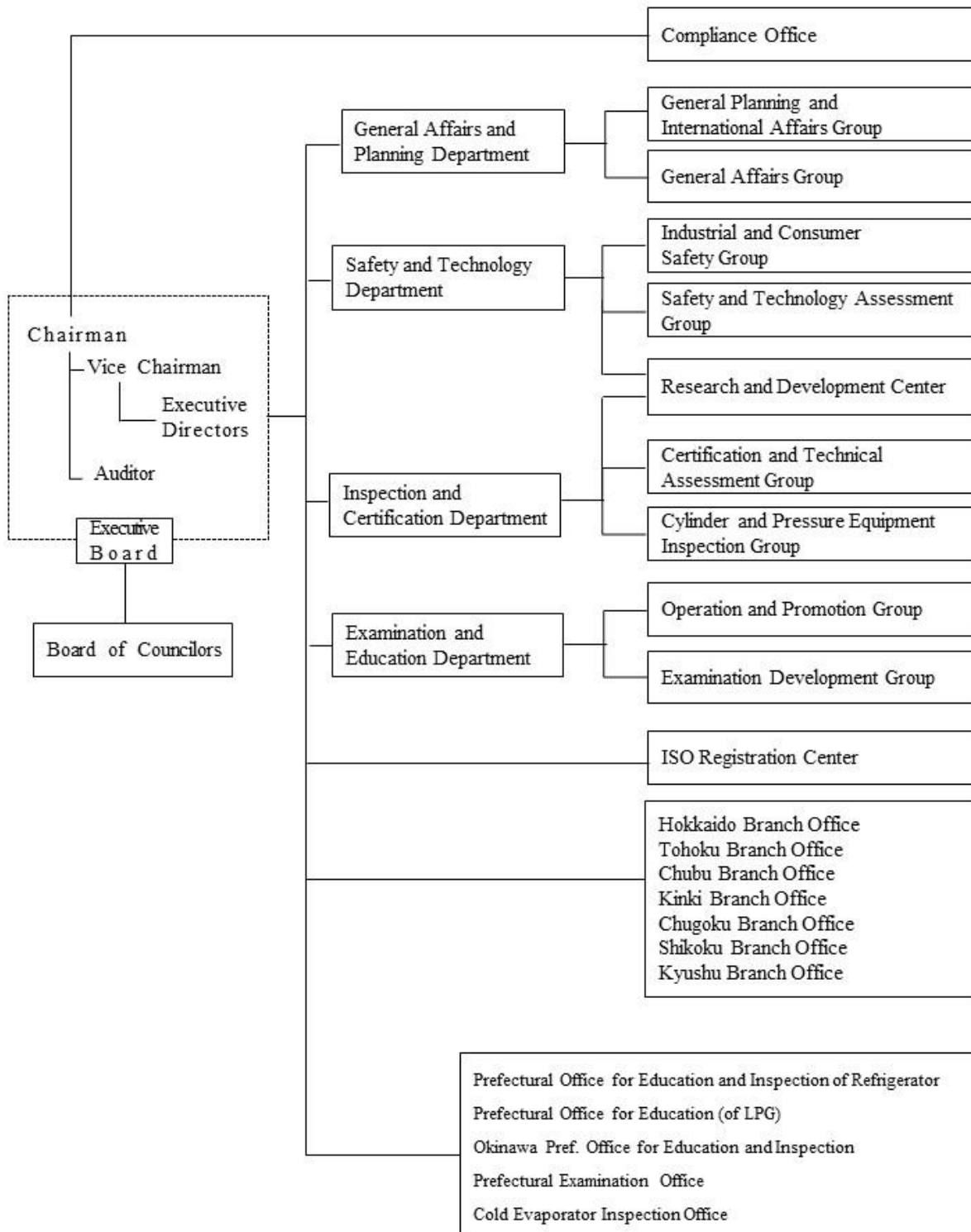
KHK participate as a delegate to online conferences organized by the American Society of Mechanical Engineers (ASME), and also has established good relations with Korea Gas Safety Corporation and Industrial Safety and Health Association of Taiwan.

4. Organization

4-1. Organization Chart

(April 1st, 2022)

Organization Chart of The High Pressure Gas Safety Institute of Japan



4-2. Membership Status

Types	March 31, 2023	March 31, 2022
Companies	829	838
Organizations	190	190
Individuals	82	83
Supporters	37	35

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 HPG Act and LPG Act.

Figure 1 shows the number of the HPG Act accidents that occurred between 2013 and 2022 classified as human damages. Note that among the HPG Act accidents, the figure excludes those involving general consumers, which pertains to LPG Act.

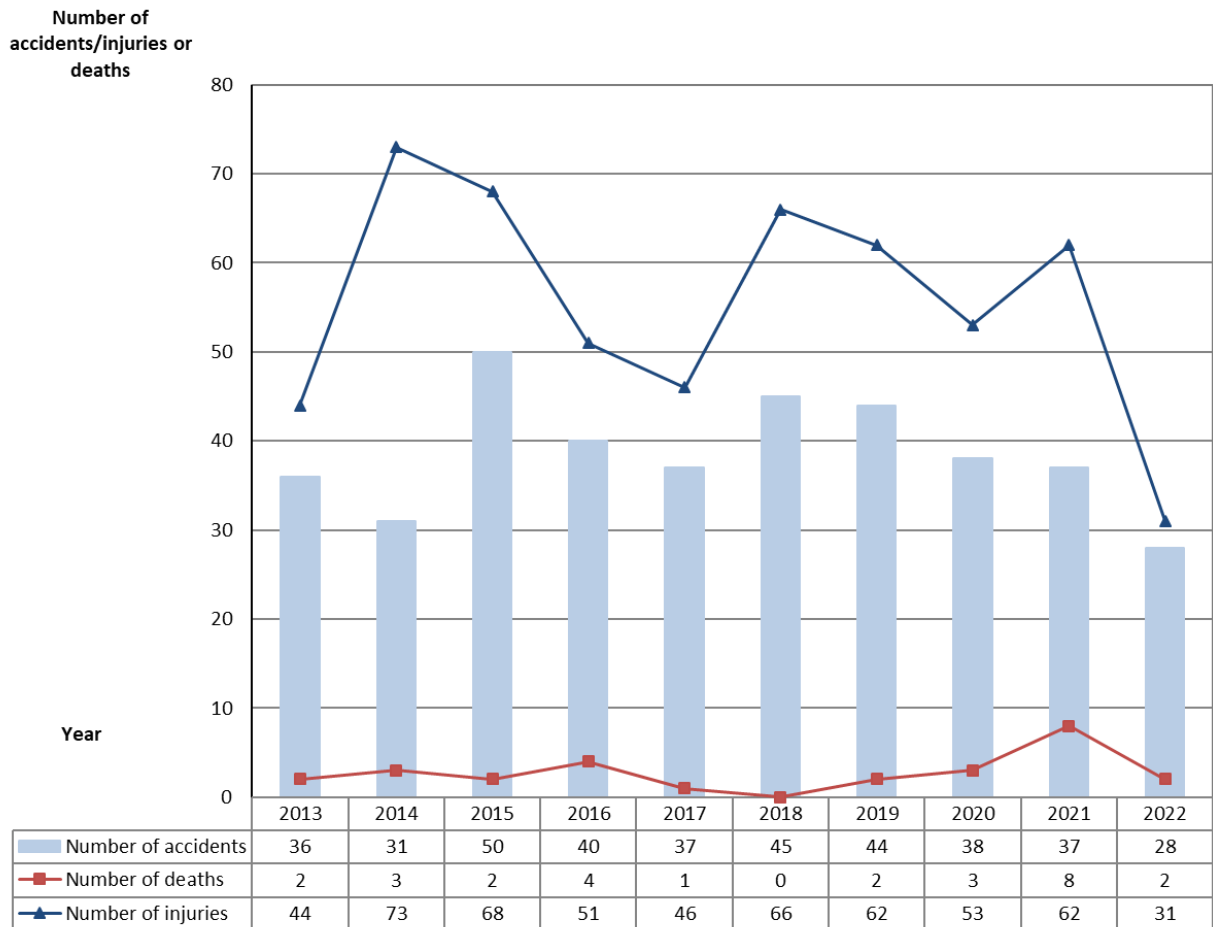


Figure 1: Change in number of the HPG Act accidents classified as human damages

Figure 2 shows the LPG Act accidents that occurred between 2013 and 2022 classified as human damages. The total number of the LPG Act accidents classified as human damages is gradually decreasing.

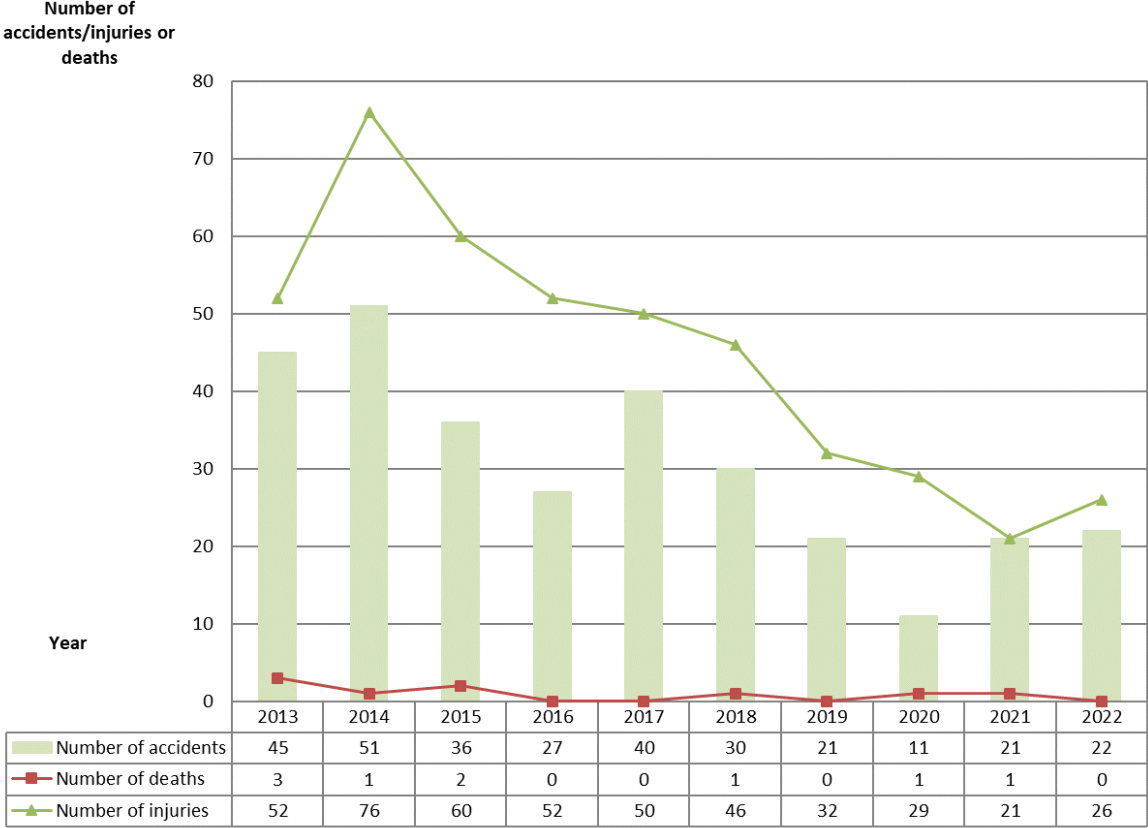


Figure 2: Change in number of the LPG Act accidents classified as human damages

Contact for inquiries related to this document

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