

# **Annual Report for Fiscal 2021**

**(April 1, 2021 - March 31, 2022)**

The High Pressure Gas Safety Institute of Japan (KHK)

## 1. Business Environment and Overview of Operations

Although the Japanese economy remains in a difficult situation due to Covid-19 infection, it is expected to improve at a moderate pace, with economic and social activities heading toward normalization by the effects of various policies and improvements in overseas economies. However, amid uncertainties due to the situation in Ukraine, it is necessary to pay close attention to the risks that supply constraints will further lower the domestic and foreign economies and to the effects of fluctuations in the financial and capital markets. As the torrential rains in July and August that caused great damage over a wide area nationwide, heavy rain disasters in Japan have become more severe and frequent in recent years, and continued response to these events has been required.

Turning to the field of high pressure gas safety, as a part of the smart high pressure gas safety policy, the procedures and inspections related to security regulations will be reviewed for "businesses that can independently secure a high level of security while making good use of technology", on the premise of ensuring safety,

In addition, as a part of the development of safety regulations for the realization of carbon neutrality, the Government considered unification of regulations for fuel cell vehicles, etc. to which presently both the High Pressure Gas Safety Act and the Road Transport Vehicle Act are applied. For the both policies, a cabinet decision on the bill has just been made in March 2022.

In view of the high public responsibility of KHK, we strengthened governance such as compliance and information security. In consideration of the future management situation, KHK prepared for the internal reorganization scheduled from April 2022, and for the improvement of the information system in line with the reorganization. Consideration was given to adopting cloud services with a secured security level while improving business efficiency. In addition, we introduced a new authentication strengthening system and thus strengthened security measures.

Regarding the business of the fiscal year 2021 of KHK, the impact of the Covid-19 infection, which was great in 2020, has been reduced, and the number of participants of legal training and examinees of national examinations is returning to normal. The income of the special accounts 1 and 2 improved significantly compared to that of 2020. On the other hand, it is still necessary to secure a venue for legal training and national examinations taking necessary measures to prevent Covid-19 infection. Under these circumstances, efforts were made to significantly reduce expenditures in order to attenuate the impact on the KHK's balance of payments. In addition, we utilized online technology such as making legal training online and remoting research work to ensure that the work was carried out without causing stagnation.

## 2. Overview of Financial Statements for Fiscal 2021

### (1) Balance Sheet

Assets	(As of March 31, 2022)	
	2021 Million Yen	2020 Million Yen
Current assets	3,680	2,666
Fixed assets	4,498	5,156
Tangible fixed assets	960	983
Intangible fixed assets	270	205
Investments	3,268	3,968
Total	8,177	7,823
<b>Liabilities/Capital</b>	2021 Million Yen	2020 Million Yen
Current liabilities	724	612
Fixed liabilities	2,440	2,268
Reserve	4,943	4,971
Profit for the term	70	-28
Total	8,177	7,823

### (2) Statement of Profit and Loss

Expenditure	(from April 1, 2021 to March 31, 2022)	
	2021 Million Yen	2020 Million Yen
Ordinary expenditure	4,374	4,233
Operating expenditure	4,374	4,233
Extraordinary loss	1	0
Corporate taxes, etc.	1	1
Profit for the term	70	-28
Total	4,446	4,206
<b>Income</b>	2021 Million Yen	2020 Million Yen
Ordinary income	4,428	4,024
Operating income	4,354	3,931
Non-operating income	74	93
Extraordinary income	18	182
Total	4,446	4,206

## 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

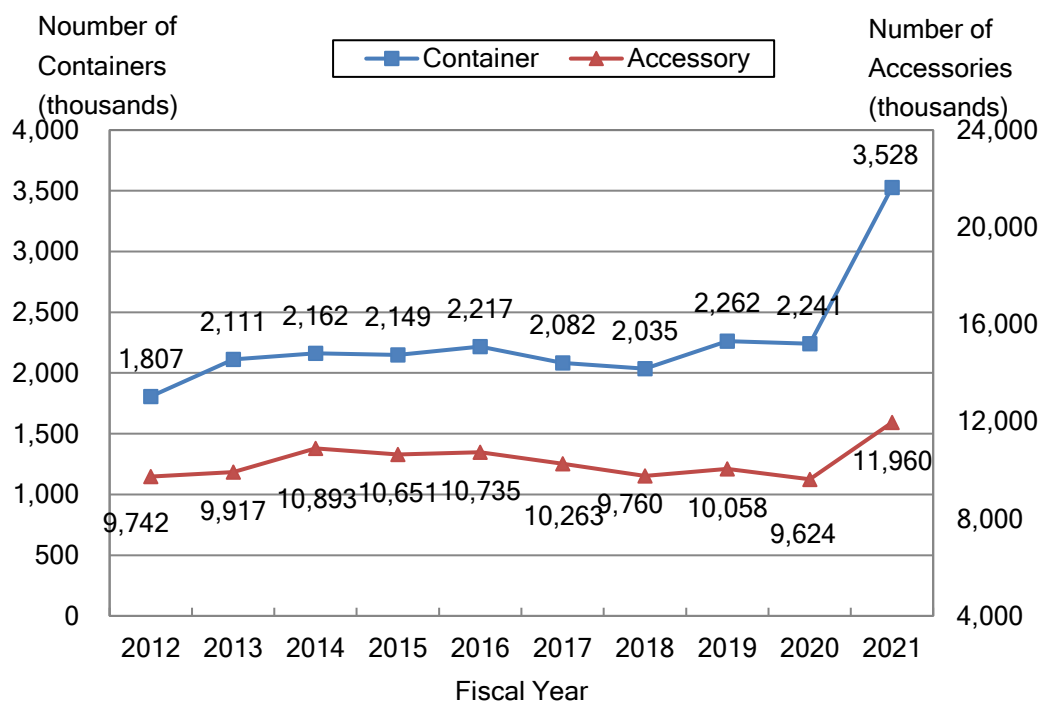
	2021	2020
Accredited completion inspection executor	18	21
Accredited safety inspection executor	20	21
Super accredited completion inspection executor	5	4
Super accredited safety inspection executor	8	5

#### (b) Inspections for Pressure Equipment

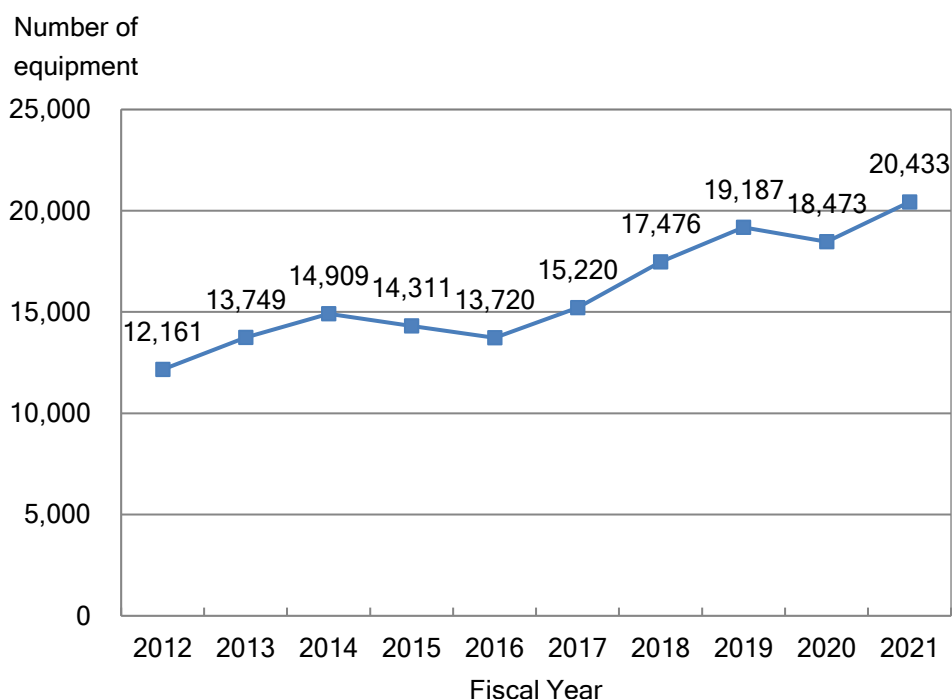
The High Pressure Gas Safety Act stipulates that the person who has manufactured/ imported a container or accessory shall apply for the Container/Accessory Inspection. We at KHK conduct these inspections.

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 2021, the number of application for inspection of containers increased by 57.4% and that of accessory equipment increased by 24.3% compared to the previous fiscal year respectively. And the number of application for inspection of Designated Equipment increased by 10.6% 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

	2021	2020
Completion inspection of refrigeration and air-conditioning facilities	46	39
Safety inspection of refrigeration and air-conditioning facilities	1,554	1,497
Approval of specified equipment (unit type refrigeration equipment)	99	130
Transfer of specified equipment (unit type refrigeration equipment)	7	7
Testing of refrigeration apparatus	320	164
Design strength verification test, etc.	158	195

(d) Examination of LPG alarm, etc.

Number of examination

	2021	2020
LPG leak alarm and Bulk gas leak sensor	2,721,354	2,659,937
LPG incomplete combustion alarm	20,180	24,540
LPG sensor	1,740	1,780

### 3-2. Education

(a) Seminars

During fiscal 2021, 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 high pressure gas safety act, technical standards, and textbooks for training. During fiscal 2021, KHK published 148 types of books, accounting for a total of 153,597.

### 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. 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 2021, it performs registration in 31 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal 2021, the number of registrations stands at 753.

(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 2021, it operates registration screenings in 34 out of the 39 JAB-accredited classes (classes 1-39). As of the end of fiscal

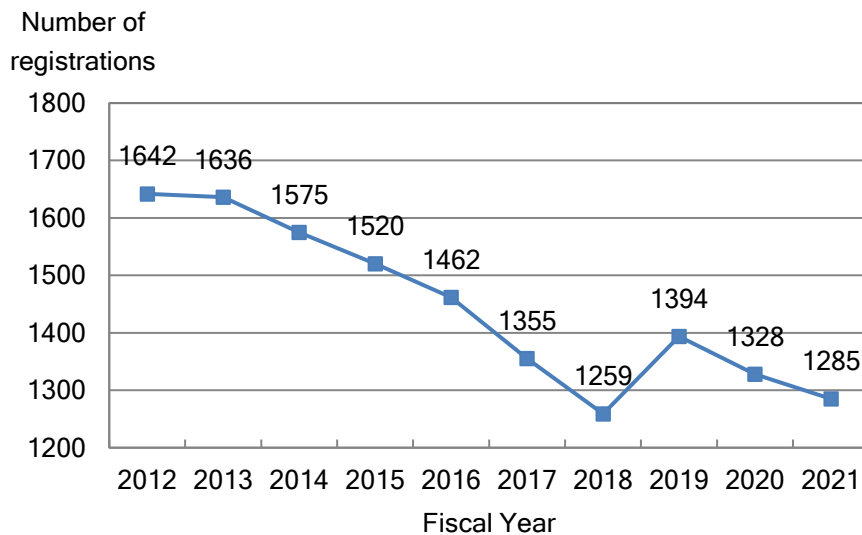
2021, the number of registrations stands at 486.

(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 OSHA18001. In July 2018, the Center initiated management based on newly established ISO 45001. As of the end of fiscal 2021, the number of registrations stands at 28.

(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 2021, the number of registrations based on ISO 22000 stands at 7 and that based on FSSC22000 series stands at 11.



**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 at METI Commerce, Distribution and Industrial Safety Policy Group, the commission performed the following safety campaigns during fiscal 2021.

(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

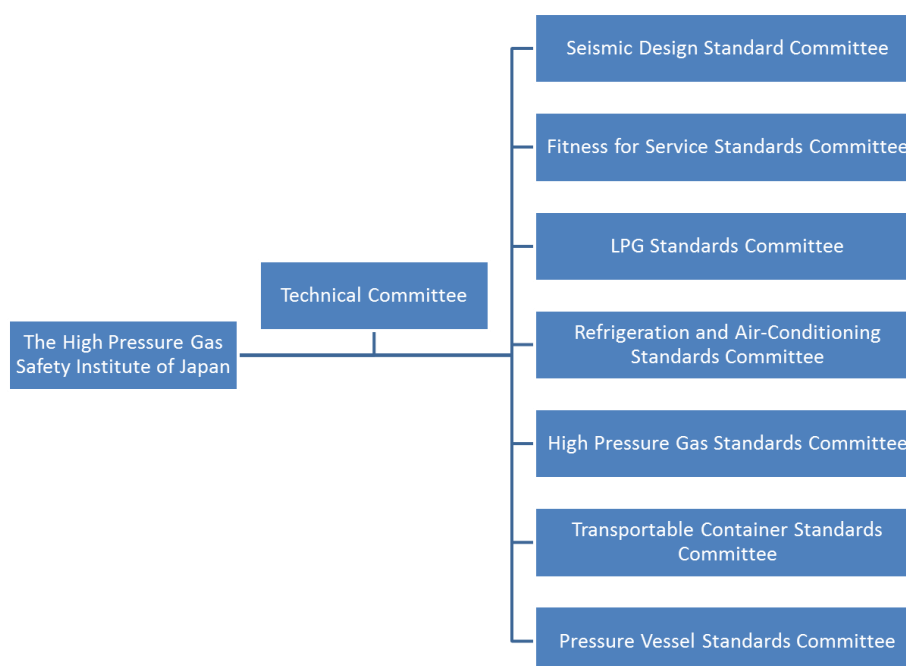
At the event, the commission offered commendations for LPG retailers and related operators including individuals with the ‘METI Minister’s Secretariat, Director-General for Commerce, Distribution and Industrial Safety Policy Award,’ ‘KHK Chairman’s Award,’ and ‘Liquefied Petroleum Gas Safety Commission 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 2021, the following standards were confirmed and revised.

(a) Confirmed Technical Standards

- Standard for Re-inspection of Seamless Container for Air Respirators (KHKS 0151)
- Standard for Re-inspection of Aluminum Alloy General Seamless Container (KHKS 0152)
- Facility Standards for Refrigeration and Air Conditioning Equipment [Ammonia Facility Edition] (KHKS 0302-4)

(b) Revised Technical Standards

- Standard for Non-circular Cylinders Pressure Vessels (KHKS 0221)
- Guidelines for Strength Design of Screw Structure (KHKS 1222)
- Standard for LPG Low Pressure Hose with Fittings (KHKS 0709)
- Standard for Self-recording Pressure Gauge and Electric Diaphragm Type Pressure Gauge for LPG (KHKS 0713)
- Standard for Anti-seismic Automatic Gas Shutoff for LPG (KHKS 0714)
- Standard for LPG Regulator (KHKS 0735)
- Standard for LPG High Pressure Hose with Fittings (KHKS 0736)
- Standard for Ministerial Notification Inspection of Bulk Storage Tanks (KHKS 0745)
- Standard for Ministerial Notification Inspection of Attached Equipment (KHKS 0746)
- Standard for LPG Bulk Storage Tank Transfer (KHKS 0840)

- Guidelines for Security Education Plan (for Refrigeration-related Business Establishments) (KHKS 1305)

### 3-6. Statutory Training (Special Account 1)

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.

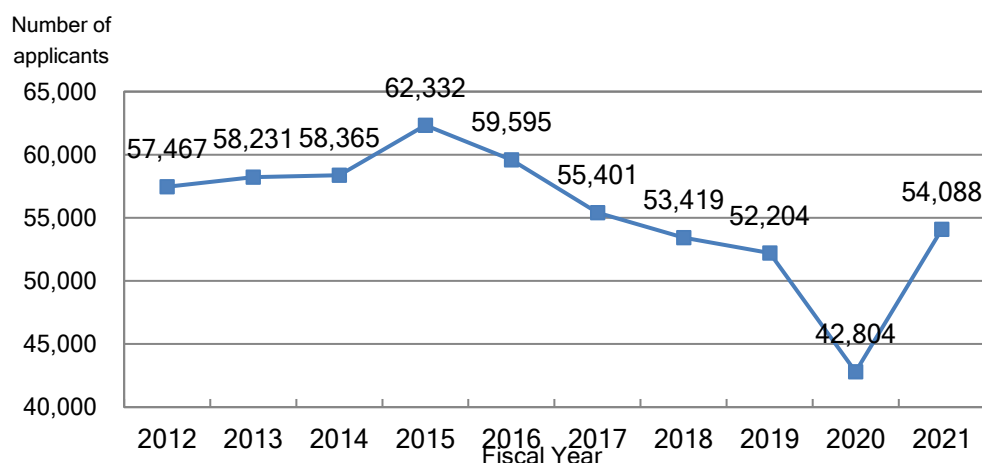
**Number of applicants for statutory training**

	2021	2020
Qualification Training	39,611	30,242
Re-training (Compulsory training)	33,133	30,697
Total of Statutory training	72,744	60,939

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

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 2021 was 54,088, which was an increase of 26.4% compared to 42,804 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 2021, the Center conducted 17 studies commissioned by private companies, etc.

#### **(b) Commissioned Studies**

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

- (1) High pressure gas safety measures
  - Study on high pressure gas safety technical standard establishment / operation
  - Study on safe use of low GWP refrigerant in freezing equipment
- (2) 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 1 Designated Equipment in Designated Equipment Inspection Regulations
- (3) Advanced security regulations for new energy, etc.
  - Study on the safety evaluation standards for hydrogen-related technologies related to compressed hydrogen stands and fuel cell vehicles
  - Study on the regulations to fuel cell vehicles, etc.
- (4) Security measures related to oil and gas supply (ii)
  - Safety technology dissemination
  - Study on LPG safety regulations
  - Study on accelerate information gathering of LPG equipment in the event of disasters
- (5) 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
- (6) 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
- (7) Operation performance confirmation and examination work such as security inspections related to the petroleum gas bedrock storage bases
- (8) Training and awards on high pressure gas safety
- (9) Seismic resistance evaluation work for the petroleum gas bedrock storage bases against large-scale earthquakes

### **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 2021 include the following:

- Grand Conference of National Association of General High Pressure Gas Safety Organizations (Tokyo, September 2021)

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 2021)

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 2021)

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 2021)

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 2021)

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 2022)

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

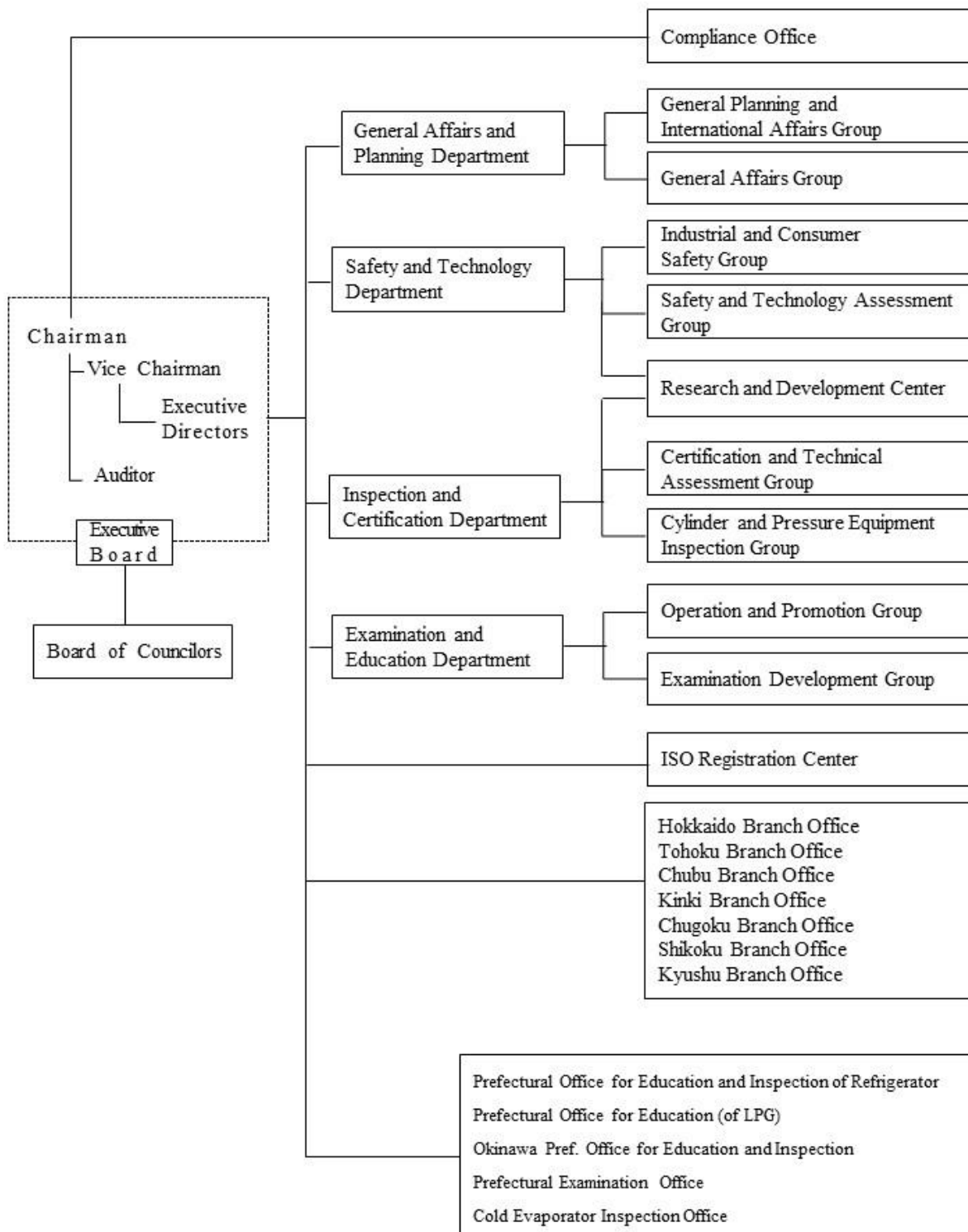
KHK participate as a delegate to online conferences organized by the American Society of Mechanical Engineers (ASME), and also has established good relations with Korea Gas Safety Corporation and Industrial Safety and Health Association of Taiwan.

## 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, 2022	March 31, 2021
Companies	838	839
Organizations	190	191
Individuals	83	82
Supporters	35	34

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 2012 and 2021 classified as human damages. Note that among the HPG accidents, the figure excludes those involving general consumers, which pertains to LPG Act.

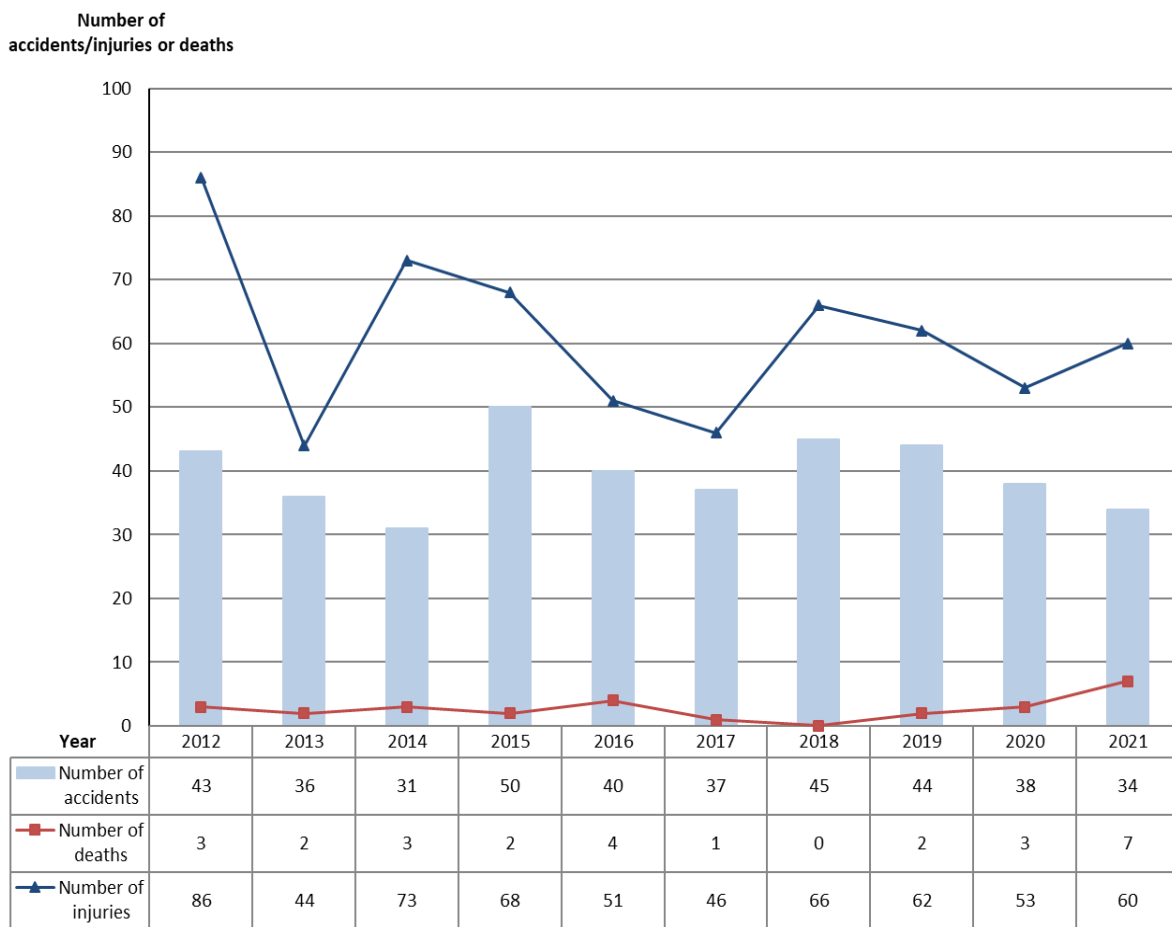


Figure 1: Change in number of HPG Act accidents classified as human damages

Figure 2 shows the LPG Act accidents that occurred between 2012 and 2021 classified as human damages. The total number of the LPG Act accidents classified as human damages is gradually decreasing.

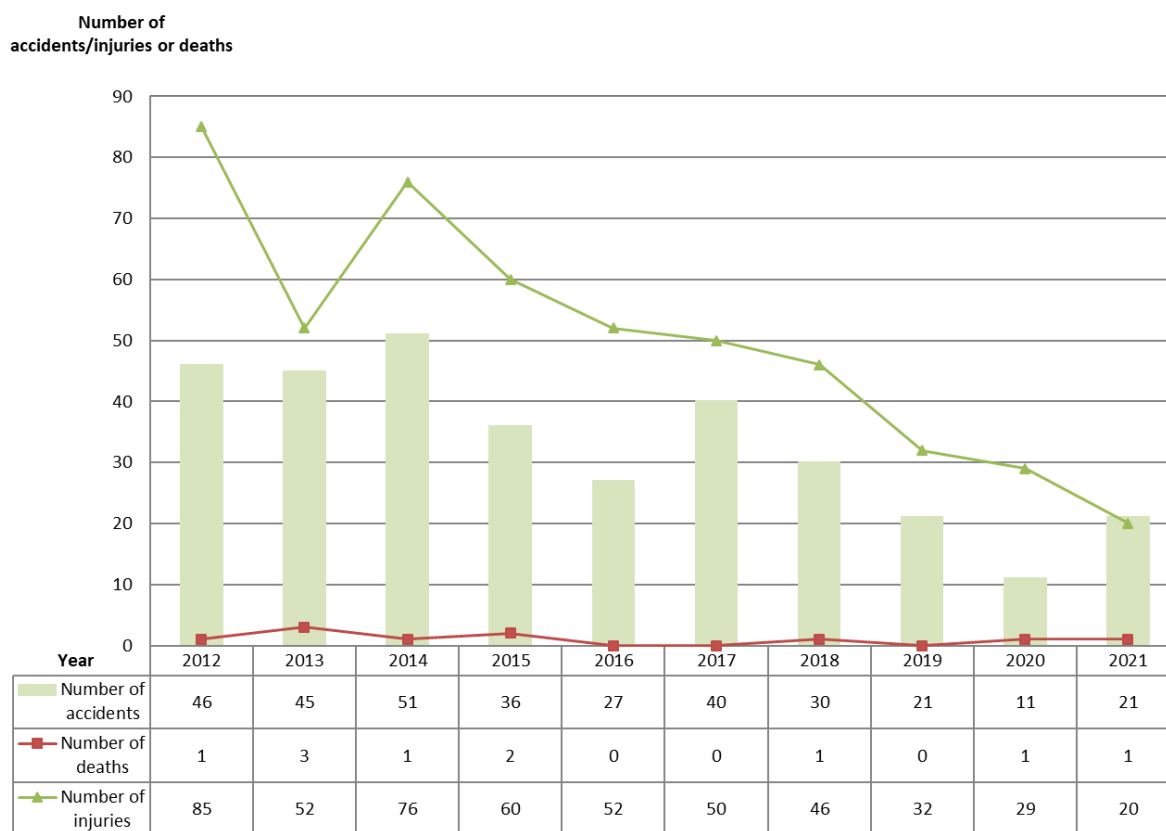


Figure 2: Change in number of the LPG Act accidents classified as human damages

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