

Customer Health and Safety

Principle and Outline

The Daigas Group announced Long-Term Management Vision 2030 in March 2017 and Medium-Term Management Plan 2023 in March 2021. Ensuring the safety of city gas as well as gas and power generation facilities is of the utmost priorities for the Daigas Group, which sets targets of continued zero serious accidents and more than 10 million customer accounts and aims to enhance the resilience of customers and society. To that end, we consider it important to work towards enhancing safety and improving preparedness for accidents and disasters.

The Daigas Group Code of Business Conduct, which sets forth the standards of conduct that our officers and employees must follow without fail, specifies “ensuring safety of products and services.” In order to ensure safety, we are committed to not only meeting legal standards but also pursuing safety from the perspective of customers in each of our operations.

Safety and Disaster Prevention Promotion Structure

We established the Safety and Disaster Prevention Committee as a corporate committee, which is a system built for ensuring governance across the company during normal times so as to centrally manage and promote measures for incidents related to safety, disaster prevention, and gas supply stability.



Operations and maintenance tasks inspected

In the infrastructure business, one accident can have various effects on stable supply and cause large losses. So, Inspections beyond the regular ones were carried out led by the Safety Subcommittee, on operations and maintenance work.

In FY2023.3 we have reaffirmed and improved our efforts and systems to prevent accidents and ensure stable supply in the energy businesses that are essential to people's lives and industry, such as gas, electricity and heat supply. In addition to continuously checking the operational status in FY2023.3, we will also expand the scope in FY2024.3 to our renewable energy business. We will roll out good practices obtained from inspection results to new businesses.

Safety and Security Efforts in the Energy Business

Ensure stable procurement by diversifying sources of LNG imported by Osaka Gas

Natural gas resources—the source of city gas and fuels for power generation—are spread worldwide. Osaka Gas started importing LNG from Brunei in 1972 and has since diversified its procurement sources.

In December 2019, a natural gas liquefaction project was launched in Texas, U.S. LNG from the United States is procured with a new method, whereby the price is determined in connection with Henry Hub prices, the index upon which the market price for natural gas futures is based in the United States. This procurement method has been added to Osaka Gas's existing procurement method, whereby the price is determined by indexing to crude oil prices.

The use of more diverse price indicators will enable us to procure LNG at stable prices even if crude oil prices fluctuate. Moreover, investment in the natural gas liquefaction project will enable us to procure a kind of price-competitive LNG, whose price is closer to prime cost, among the kinds of LNG whose prices are linked to Henry Hub prices.

We will continue our efforts to procure more affordable LNG in a more stable manner.

LNG Handled by Osaka Gas (Including Fuel Used for Power Generation and Wholesale)

(thousand ton)

Fiscal Year	21.3	22.3	23.3
Brunei	454	641	160
Indonesia	285	127	0
Malaysia	945	942	1,153
Australia	3,436	4,011	4,756
Russia	384	449	321
Qatar	421	179	0
Oman	1,271	1,335	1,460
Papua New Guinea	1,308	1,663	1,939
USA	1,836	2,803	679
Others	235	274	141
Total	10,575	12,443	10,608

Safety measures at LNG terminals

[Our system docks LNG tankers safely](#)

At the Osaka Gas LNG terminals at Senboku and Himeji, we strive for complete safety on site and in the surrounding areas. This safety begins as soon as the tankers carrying LNG dock at dedicated piers at the LNG terminals.

The tankers bringing LNG from around the world are docked with the utmost concern for safety. Osaka Gas developed its own system specifically for safely docking tankers through a series of processes.

This system uses a GPS to monitor in real time the position of the tankers to an accuracy of 10 cm as they enter and leave the port, and dock and undock.

[LNG tank safety measures](#)

The LNG transported by tanker is fed into LNG tanks from the dock. To ensure a stable supply of city gas, our two LNG terminals have a total of 25 LNG tanks, including one of the world's largest land-based tanks.

Tanks are equipped with advanced earthquake-proof technology. Should there be a gas leak, the tanks have dikes to stop the LNG from flowing to the outside. And there are high-expansion foam discharge systems and water curtain facilities to contain any spilt LNG.



High-expansion foam discharge and water curtain facilities along the dike around an LNG tank

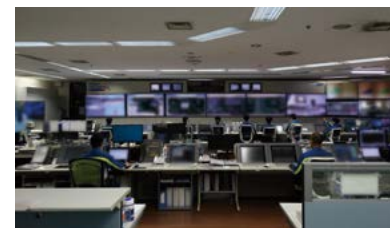
[Odorization aids gas leak detection](#)

At Osaka Gas's two LNG terminals, the LNG brought in by tankers at a temperature of -160°C is vaporized using the heat of sea water, then the heating value of the gas is adjusted before it is delivered to customers. Because natural gas is odorless, it is given a specific odor so that it can be detected in case of a gas leak.

[Monitored 24 hours a day, 365 days a year](#)

Central control rooms at LNG terminals carry out around-the-clock monitoring and operation of all processes from receipt of LNG, vaporizing of the gas, to delivery of the product.

These central control rooms also carry out monitoring and operation of all of the incident detectors and surveillance cameras so that problems are detected promptly and prevented from spreading. If an incident detector picks up a problem, an alarm is sounded in the central control room and staffs are on the scene immediately.



Central control room at an LNG terminal

[Developing a Business Continuity Plan to Take Effect During a Large-scale Disaster or Accident](#)

In July 2013, the Daigas Group formulated a Business Continuity Plan (BCP) to be implemented in the event of a large-scale disaster or accident. This BCP, which we have disseminated throughout our Group, outlines responses to identified risks.

It assumes a situation in which the company and society at large are affected by an earthquake or tsunami resulting in a paralysis of various functions, or a functional failure due to problems with raw materials suppliers and our equipment. According to the terms of the "Act on Special Measures for Pandemic Influenza and New Infectious Diseases," the company shall respond promptly and accurately to the outbreak of a new strain of influenza or the like to prevent infection of employees and to protect public health. We have established company regulations under the name of the "Pandemic Influenza and New Infectious Diseases Preparedness Action Plan" in order to ensure the stable supply of gas in such a situation.

In principle, we review our BCP annually and promote employee awareness by implementing BCP training, earthquake drills, and education and training incorporating e-learning.

In the event of an earthquake, we must respond by upholding business continuity in parallel with implementation of disaster response operations, so clearly advanced disaster response capabilities are required as well. By simultaneously implementing earthquake drills and BCP training in FY2023.3, we were able to identify the challenges of maintaining business continuity concurrently with disaster response operations, thus strengthening our overall disaster-response capabilities.

Osaka Gas Network Co., Ltd. initiatives: Safety measures during supply

Monitoring and replacing gas pipes

City gas is delivered to customers via the gas pipeline network. Therefore, Osaka Gas Network Co., Ltd. recognizes that keeping the gas pipes safe and properly maintained is one of the most important matters and is constantly replacing old metal pipes with pipes made of polyethylene, which is highly durable and earthquake resistant.



Pipes made of polyethylene exhibit superior strength

Building resilient facilities

To ensure stable city gas supply, we believe that it is important to renovate the processing facilities, build a gas pipeline network, and take disaster prevention measures in accordance with meticulously devised plans to strengthen our foundation to secure a higher level of stability in the gas supply.

Osaka Gas Network Co., Ltd. is working to improve the earthquake resistance of gas facilities as a preventive measure (promotion of the spread of earthquake-resistant facilities), including the introduction of highly earthquake-resistant gas pipes. We are refurbishing aged gas pipes and introducing pipes with superior resistance to earthquakes and corrosion according to the plan. We are actively proposing the repair of old buried gas pipes at customers' sites that pose a risk of corrosion. We completed measures for cast iron pipes (pipes requiring measures) ahead of schedule from FY2021.3 to FY2016.3. We continue to implement measures for cast iron pipes (to be maintained and managed) and pipes for preventing corrosion and deterioration.

As part of emergency measures to prevent secondary disasters, we have established a gas shutoff system to prevent secondary disasters caused by gas leakage in the event of an earthquake or other disaster.

In accordance with the Ministry of Economy, Trade and Industry's "Gas Safety Upgrading Plan," we are working to increase the percentage of earthquake-resistant pipes, which indicates the ratio of earthquake-resistant pipes to the total, and to subdivide supply blocks to keep gas shut off due to emergency measures to the minimum extent possible.

We believe that energy resilience can be improved by taking both measures: increasing earthquake resistance as a preventive measure against earthquakes and minimizing damage and achieving early restoration in the event of an earthquake.

Security measures to prevent accidents

Osaka Gas Network Co., Ltd. ensures that the following security measures are taken to prevent the occurrence of accidents including gas leaks.

1. Regular inspection of gas pipes along the pipelines to ensure there are no gas leaks
2. Inspection and repair of facilities including regulators, valves, and gas pipes on bridges
3. Meetings with contractors who are doing excavation work for water and sewage pipes, and electrical and phone lines near Osaka Gas pipelines, as well as inspection of the work sites, before, during, and after the work



Regular inspection of gas pipes on bridges

Integrated system for monitoring and controlling the gas supply

The Central Control Room of Osaka Gas Network Co., Ltd. ensures a stable and safe supply of gas 24 hours a day, 365 days a year.

We have a gas supply monitoring and control system that keeps a constant watch on gas, from the LNG terminals to every corner of the pipeline network. The system constantly gathers data on gas pressure, flow volume, and irregularities from points around the gas pipeline network, providing integrated control through remote operation that controls production and supply and detects any problems.



Central Control Room

Osaka Gas Network Co., Ltd. initiatives: Emergency response system and anti-disaster measures

Taking calls and responding all day, every day

It is particularly important to establish an initial response system in the event of accidents and natural disasters and act appropriately in response to such events.

Osaka Gas Network Co., Ltd. has established a unified security system covering the entire supply area. Under the system, if gas leakage occurs, the Central Control Room will take charge of all relevant duties, including receiving an accident report and dispatching security staff to the accident site. Specifically, the Central Control Room will order the dispatch of the emergency vehicle that can reach the accident site the fastest by taking various factors into consideration, such as availability of vehicles and their locations.

The Central Control Room accepts emergency reports, such as a gas leakage, around the clock via dedicated telephone lines set up in the Room. After an accident is reported, emergency staff will be sent to the site immediately and work in close collaboration with local police and fire departments.



Central Control Room (emergency call reception)

Initiatives for coordination with local governments in the event of a disaster

Osaka Gas Network Co., Ltd. has concluded agreements with local governments on coordination in the event of a major disaster or in other similar situations. The purpose of the agreements is to quickly stabilize people's lives by working together with local governments to restore gas supplies safely in the event of any major disaster. As of March 2023, the company has concluded agreements with approximately 70 local governments within the supply area, including Osaka City.

With this agreement, the company will deepen its cooperation with the government in normal times even more than before, and build a system for cooperation and collaboration in the event of a disaster.

Emergency response system and anti-disaster measures

Measures against possible large-scale earthquakes

Daigas Group has taken a range of measures for dealing with large earthquakes, including installing earthquake-resistant polyethylene pipes and intelligent meters that detect vibrations from the earthquake and shut off the gas supply and securing an emergency communications network. In addition, the Great Hanshin-Awaji Earthquake of 1995 has prompted us to step up these measures.

We have installed seismometers in the Group's service area, which allow us to quickly determine the seismic intensity and other information. The service area is divided into blocks. In the event of the detection of ground shaking that may cause damage to gas pipelines, to prevent secondary damage, gas supplies are shut off block by block. This is possible thanks to a system of automatic gas shutoff devices equipped with a seismoscope as well as remote gas shutoff devices that are activated by command from the Central Control Room. If the Central Control Room is physically damaged, the Central Control Subcenter set up with a similar function will take over its task.

We also make constant efforts to improve employees' ability to respond to emergencies, including conducting company-wide disaster drills and providing disaster prevention education through e-learning, in addition to taking physical countermeasures against earthquakes as described above.

In FY2023.3, as a company-wide disaster drill, we conducted a company-wide earthquake drill and business continuity plan (BCP) training simultaneously, continuing from last year, to identify issues arising from conducting disaster response and business continuity operations at the same time. In the drill, which was based on the scenario of an earthquake of magnitude 8.7 with an epicenter in the Nankai Trough, a task force, headed by the President of Osaka Gas, was formed at the Head Office. We worked to strengthen our initial disaster-response capabilities and share the disaster response flow until the completion of restoration.

In addition to approximately 2,000 employees of the Group, including partners, 50 people from 13 retailers other than Osaka Gas also participated in the drill to confirm cooperation in disaster response.

Progress of Earthquake Countermeasures after the Great Hanshin-Awaji Earthquake

Focus	Main earthquake countermeasures	At the time of Great Hanshin-Awaji Earthquake (January 1995)	Present (April 2023)
Strengthen information gathering function	Install additional seismometers	Installed at 34 locations	<ul style="list-style-type: none"> Installed at approx. 3,300 locations
	Introduce earthquake damage prediction system	—	<ul style="list-style-type: none"> Introduced at the Central Control Office (head office, back-up center) and 5 areas
Establish supply suspension system	Subdivide supply blocks into smaller segments	55 middle blocks	<ul style="list-style-type: none"> 87 middle blocks 713 little blocks
	Introduce supply suspension equipment	Remote suspension equipment only for super blocks (dividing the supply area into 8)	<ul style="list-style-type: none"> Remote suspension equipment at approx. 3,600 locations Earthquake-sensitive automatic suspension equipment at approx. 3,000 locations
Strengthen emergency communications	Strengthen wireless systems	—	<ul style="list-style-type: none"> Head office and back-up center serve as two hubs 6 portable satellite communications facilities
Other	Ratio of strengthening of earthquake resistance	Percentage of earthquake resistant pipes: 68%	<ul style="list-style-type: none"> Percentage of earthquake resistant pipes: Approx. 89%
	Promote widespread use of polyethylene (PE) pipes	PE pipeline length: Approx. 1,200 km	<ul style="list-style-type: none"> PE pipes used for basically all low-pressure pipelines PE pipeline length: Approx. 17,900 km
	Promote widespread use of microcomputer meters	Overall adoption rate: Approx. 75%	<ul style="list-style-type: none"> Installation completed for residential sector Overall adoption rate including non-residential sector: Approx. 99%
	Back up important online information	—	<ul style="list-style-type: none"> Back-up center opened

Status of technology development and operation for disaster preparedness and recovery support

Various in-house organizations must work in close cooperation to restore gas supply suspended because of a disaster or accident. This requires that information on conditions at trouble spots be shared immediately.

Osaka Gas developed the "BRIDGE" disaster recovery support system to centrally manage real-time information from the onset of a disaster/accident through recovery, and put this system into operation in April 2012. The system links up map information with customer information, making it possible to "visualize" recovery actions by centrally managing on-site progress and reducing the time needed to complete recovery work.

In addition, the "OG-DRESS" mobile-based reporting system aimed at supporting disaster recovery has been established, enabling reporting on completion of recovery work via mobile phone. Based on such a system, we will make our response actions in the event of a disaster expeditious.

We developed the "Typhoon and Torrential Rainfall Information System," which provides centralized information on accumulated rainfall and landslide disasters during typhoons and torrential rainfall, and have been operating the system since 2015. We also built a system to grasp the risk of river flooding at an early stage and have operated it since 2021. If we identify a risk of inundation of gas supply facilities due to river flooding, we will establish an emergency system and take preventive measures for the facilities to ensure the safe supply of gas for our customers. We have developed a "recovery visualization system" that provides easy-to-understand information on the restoration of gas service to customers living in areas where gas supply is cut off due to a major earthquake. In the event of a major earthquake, the top page of our website switches to an emergency-use page that provides status updates on gas supply stoppage and restoration using this system.

The recovery visualization system has two types of browsing functions: a map on which the gas recovery status is shown color-coded by stage and a list that shows the gas recovery progress by area.

We will continue to work to improve our disaster prevention and mitigation measures against earthquakes and other natural disasters and to deliver city gas to our customers with greater safety and stability.

*Since April 2022, the city gas supply business has been conducted by Osaka Gas Network Co., Ltd.

Passing on advanced knowledge and skills in safety and disaster prevention

Based on the belief that our greatest mission is to deliver gas safely and securely, the Daigas Group strives to nurture human resources with a high level of knowledge and skills in the areas of safety and disaster prevention.

At LNG terminals, a system with a 3D animation function was installed to simulate things that are not easy to experience, such as a more realistic reproduction of a fire or other serious accident, to improve the quality of training and transfer skills. The Technical Skill Development Center of Osaka Gas Network Co., Ltd. strives to develop human resources with advanced knowledge and skills through high-quality lectures, abundant video content, etc., with the aim of preventing gas accidents and accidents resulting in injury or death. To convey the lessons learned from various past failures, we have also set up experiential-type training facilities that reproduce the circumstances at the time of these failures. Also in the Energy Solutions Business Unit, the Human Resource Development Centre provides various training programs to improve the quality of work related to security, such as starting service of gas supply, regular safety checks of gas appliances, and installation and repair of equipment.

In order to further solidify "safety," we have established the Four Safety Principles as a universal code of conduct common to those involved in safety as part of their work. We aim to eliminate accidents and problems by adhering to these four principles, which are: adherence to rules, reliable communication, reconfirmation, and interruption at unexpected times. We will follow these provisions to help make ourselves continuously aware of our responsibility to customer safety.

Products and services ensure safe use by customers

[Informing customers about safe use of gas appliance](#)

To ensure that customers can use their gas appliances with peace of mind, we take every opportunity to talk to them about the safety of their appliances: during regular safety inspections, when providing a new gas service, and when conducting repairs.

The Osaka Gas website has a section with important announcements on gas appliances, where we talk about the proper use of gas appliances, and post prompt notices about product modifications or defects.

[Developing and promoting the use of safer gas appliances](#)

The Daigas Group strives to bring customers products and services that ensure the safe use of gas. In 1992 we developed an automatic shut-off device for gas stoves and in 1999 a small gas water boiler with interlock mechanism*1. To eradicate fires originating from gas stoves, since April 2008 all products have been equipped with an auto shut-off function to automatically turn off the gas when the user forgets to. We have been working to spread the use of this product, called the “Si” Sensor-Equipped Cooking Stove.

In 2019, we developed and launched a new safer and securer gas stove in cooperation with Paloma Co., Ltd. to reduce the risk of clothing catching fire*2 during cooking. The new gas stove is equipped with area sensors*3, an industry-first technology. When a sleeve or other object comes close to the flame, the sensors detect it, lower the flame automatically, and sound a voice alert. The product obtained recommendation certification as a product with effective fire and disaster prevention functions from the Fire Equipment and Safety Center of Japan, the first time for a cooking device. Meanwhile, we would like to eradicate all old gas appliances that lack safety mechanisms. In particular, we visit customers who are still using old appliances that are not equipped with incomplete combustion prevention devices, such as small tankless gas water heaters and wire-mesh gas stoves, and recommend that customers upgrade to safer gas appliances.

The Group also provides gas alarm systems that warn residents of a gas leak or carbon monoxide and offers a range of safety-related services, including the dispatch of staff to a home when trouble is detected.

*1 Interlock mechanism: A device that stops the ignition process after the incomplete combustion prevention mechanism is triggered three times.

*2 Clothing catching fire: A sleeve, for example.

*3 Area sensors: It is a registered trademark of our company.

■ Changes in the Rate of Use of Water Heaters with an Incomplete Combustion Prevention Device and Gas Stoves with a Function of Automatically Turning off the Flame

	FY2019.3	FY2020.3	FY2021.3	FY2022.3	FY2023.3
Water heater with an incomplete combustion prevention device	99.9%	99.9%	99.9%	99.9%	99.9%
Gas stove with a function of automatically turning off the flame	96.0%	96.1%	96.2%	96.3%	96.3%

[Announcement of joint development of a smart meter system](#)

Osaka Gas Network Co., Ltd., Tokyo Gas Network Co., Ltd., and Toho Gas Network Co., Ltd., which are city gas pipeline companies, have been working to jointly develop a smart meter system for the city gas business with the aim of increasing the efficiency of gas meter reading and gas line closing operations in normal times and improving disaster resilience.

The introduction of communication-enabled smart meters will increase the efficiency of on-site work through remote gas meter reading and gas line closing. The smart meters will also enable remote gas shutoff operations (gas line closing) in the event of gas leakage as well as remote safety measures (gas line closing) and gas restoration operations (gas line opening) in the event of a disaster. This will further help enhance safety and improve resilience in supplying city gas.

We believe that joint development of the system responsible for signal exchange between smart meters and various business systems will not only reduce development costs, but also contribute to improving social benefits.

[Product Safety Voluntary Action Plan for residential gas appliances](#)

The Daigas Group, as a distributor of residential gas appliances and a repair and installation business, strives to ensure the safety of residential gas appliances, acting according to the Product Safety Voluntary Action Plan, being based on a strong determination to continue to ensure that our customers enjoy safe, secure, and comfortable lives.

 [Product Safety Voluntary Action Plan for residential gas appliances](#)

[When problems occur](#)

When there is a product accident or other problem with a gas appliance that it sold, installed, or repaired, the Daigas Group immediately informs the media and places notices in newspapers and on its website. At the same time, the Group proceeds with the inspection of the product in question and if necessary repairs it or replaces parts.

No such incident occurred in FY2023.3