Process safety and disaster prevention

102-11, 102-12, 102-15, 102-43, 103-1, 103-2, 103-3, 403-5 (Occupational health and safety 2018), 404-2

We implement process safety and disaster prevention activities with the aim of ensuring the safety of employees and maintenance of safe, stable operations, stipulating matters relating to prevention of accidents, emergency response and strengthened security.
Through these activities, we aim to completely eliminate accidents.

Kao's creating value to address social issues

Social issues we are aware of

As we have several large-scale chemical plants, their process safety and disaster prevention needs are increasingly heightened in the context of the recent increase in the number and severity of accidents at chemical plants and natural disasters.

As such, we will undertake to enhance our safety capabilities, and strengthen our disaster prevention measures on a daily basis.

Risks related to realization of What Kao Aims to Be by 2030

We regard outages of stable operations from major accidents impacting regions in the vicinities of plants, natural disasters or other factors, and the accompanying loss of societal trust in the company from these things as risks.

Opportunities related to realization of What Kao Aims to Be by 2030

Implementation of thorough safety processes and disaster prevention initiatives ensure the safety of communities and employees which leads to trust in the company and enhancement of its brand image.

Kao's creating value

Kao, as a company with large-scale chemical plants, will provide regional communities in which local residents can live in peace of mind and employees at worksites can operate in safety without fear of accidents.

Contributions to the SDGs

Policies

Activities to ensure process safety and disaster prevention are clearly stipulated in the Kao Responsible Care (RC) Policy, which states that Kao will "strive to prevent accidents by improving on-site safety competency" and that furthermore, "Top management will exercise leadership to continuously improve our safety culture and safety infrastructure by putting safety first. We will also maintain safe and stable operations by systematically implementing equipment-related and administrative measures. We shall strive to prevent fires, explosions and chemical spills, place maximum priority on safeguarding human life when responding to natural disasters, and prepare for emergencies by conducting periodical training that takes into consideration the need to strengthen security related to facilities, processes and technology." We are endeavoring to prevent accidents and disasters in accordance with this policy.

Web Kao Group Responsible Care Policy
www.kao.com/content/dam/sites/kao/www-kao-com/global/en/sustainability/pdf/responsible-care-policy.pdf

Education and promotion

Through education planning using past cases, the latest technologies and knowledge, as well as response drills on process safety and disaster prevention, we are able to communicate skills and strengthen security. Along with this, we strive to raise employees' disaster prevention awareness by planning and conducting drills for natural disasters and fires.

Collaboration and engagement with stakeholders

By conducting events related to safety and disaster prevention in cooperation with partner companies, we aim to further raise disaster prevention awareness and become a safer, more secure company.

In addition, by conducting information exchange meetings on a regular basis with everyone in the regions that surround our plants, we are deepening communication with local communities.

Process safety and disaster prevention 102-20, 403-1 (Occupational health and safety 2018)

Framework

Our daily activities for process safety and disaster prevention are conducted as part of the RC promotion system. In particular, we have built a framework to keep track of accidents or disasters when they occur, through our global emergency reporting network. The organizational framework used in an emergency situation is separate from the Board of Directors, etc.; an emergency organization is established, headed by the President, and takes action under the direct supervision of the President. In addition, when an accident or disaster occurs that we anticipate will have a major impact on our business activities, we will establish an Emergency Response Team Organization headed by the President. Together as a group, our initial response places top priority on the safeguarding of human life as we implement measures including our Business Continuity Plan*.

* Business Continuity Plan
A plan for continuing key corporate activities through procedures to decide in advance which operations and functions should be continued, and which methods should be applied to continue activities, assuming various situations that cause the interruption and / or shutdown of business activities due to various events and the factors behind their occurrence.

→ Risk and crisis management
P267

Mid- to long-term targets and performance

Mid- to long-term targets

We actively strive to realize our goal of complete elimination of on-site fires, explosions, leakages and logistics-related leakage accidents.

Anticipated benefits from achieving mid- to long-term targets

Business impacts

Mitigation of unnecessary expenses and reductions in overall costs, leading to higher revenues with sound implementation of business activities from safe operations at all worksites

Social impacts

Ensuring the stable provision of products with sound implementation of business activities from safe operations at all worksites. Moreover, this can facilitate the stabilization of product prices.

Process safety and disaster prevention 403-9 (Occupational health and safety 2018)

Performance in 2021

Performance

In 2021, to maintain safe, stable operations and work toward eradicating process safety accidents, we conducted safety assessments at our chemical facilities, including policies to prevent dust explosions, abnormal reactions and spontaneous combustion, and implemented policies to respond to natural disasters. In addition, detailed implementation specs and plans were drafted for respective divisions with the targets of enriching disaster prevention drills and enhancing security. Also during 2021, the disaster prevention audits we normally carry out each year at our plants outside Japan, to enhance their level of safety and disaster prevention, were postponed to prevent the spread of COVID-19.

Moreover, last year we formulated the Kao Grand Design for Process Safety to be achieved by 2030, and shared the design's 13 action plans, which aim to reinforce our safety culture and fundamentals and enhance safety, with related divisions and plants, and we are promoting activities by incorporating the action plans into each workplace. Small-scale fires and explosions occurred in 2021, but there were no accidents involving leakages or logistics-related leakages*1. For each safety accident, we conduct an accident cause analysis using the 4M5E method*2 and implement measures to prevent similar accidents in the future. In 2022, we will continue activities directed toward our targets of completely eliminating on-site fires and accidents related to explosion, leakage and logistics-related leakage accidents.

*1 Logistics-related leakages
Accidents involving leakage while products, etc. are being transported

*2 4M5E method
A method for conducting causal analysis from the standpoint of four M-factors: Man (people), Machine (machine and facility), Media (material and information) and Management (management and education), followed by response policies from the standpoint of five E-factors: Education (education and training), Engineering (technology and engineering), Enforcement (strengthening and strict adherence), Example (model and example) and Environment (environment, background)

Overview of accidents (2021)

Type of accident	Small-scale fires: 4 cases; Explosions: 1 case
Overview of accident	• Water dripping from an air-conditioning unit onto a control panel caused a short circuit, resulting in a fire • During hot work, sparks flew onto flammable material, causing a fire • Hot oil leaked out from the seal of the hot oil pump, and ignited spontaneously • The oil inside a fire-fighting pump ignited during a periodic inspection • Material in a distillation condenser that had a low flash point due to solidification ignited and exploded when it entered the tank
Counter-measures being taken	• Performance of analysis using the 4M5E method to determine the causes of the accidents, and thorough implementation of countermeasures • Promotion of equipment replacement, and strengthening of monitoring device provision

Targets and performance

Item	Scope	Indicator	2020	2021		2022
			Results	Target	Results	Target
Accidents	Kao Group	Fires, explosions, leakages, etc. (no. of accidents)	2	0	5	0
		Logistics-related leakage (no. of accidents)	0	0	0	0

Reviews of performance

Going forward, we will continue further improving our frontline safety capabilities and striving to enhance our safety culture and safety fundamentals, while fine-tuning and revising the Grand Design for Process Safety established last year.

Process safety and disaster prevention 102-11, 102-15, 403-5 (Occupational health and safety 2018)

Our initiatives

Emergency response drills to prepare for large-scale disasters

Besides implementing fire response training and emergency evacuation training at the level of individual worksites, we also conduct training on a company-wide basis to prepare for large-scale disasters.

Training in the use of the system for reporting the safety of Kao employees

To prepare for natural disasters, the Kao Group in Japan has adopted a web-based Employee Safety Confirmation System. Twice yearly, in March and September, all employees undertake personal input drills. During the September 2021 drill, we used the message field to enter detailed damage-related information. We will continue to hold drills on the premise on actual disasters as they occurred.

Below is an overview of uses of the Employee Safety Confirmation System in natural disasters in 2021. Confirmation of employee safety through deployment of the Employee Safety Confirmation System during these natural disasters resulted in no critical human casualties.

In addition, we are using the Employee Safety Confirmation System on a weekly basis to confirm the health of our employees during the COVID-19 pandemic.

Usage of the Employee Safety Confirmation System in 2021

Date	Disaster	Result
Oct. 2021	Earthquake in the Greater Tokyo Metropolitan area	Safety confirmation completed for 100% by the next day

Company-wide earthquake scenario reporting and communication training

We are consolidating organizational units for disaster response in Eastern Japan and Western Japan premised on damage to the Kao Head Office from an earthquake in the Greater Tokyo Metropolitan area. In June 2021, we implemented disaster response drills premised on an earthquake in the Nankai Trough area, involving local organizational units and those in Eastern Japan, while in September we repeated these drills for organizational units in the Kanto area and Western Japan, premised on an earthquake with its epicenter directly under the Tokyo Metropolitan area.

During these drills, based on locations during the daytime on weekdays, statuses were confirmed by IP radio within major disaster response organizational units, and promptly transmitted to Emergency Countermeasure Headquarters through our internal disaster bulletin board and website and information management portal system. Necessary response drills were implemented by the organizational units responsible for disaster response based on the relevant data. Moreover, during the November drill, which was premised on an earthquake in the Greater Tokyo Metropolitan area, the President participated as head of the Emergency Countermeasure Headquarters. Due to COVID-19, the members of Emergency Countermeasures Headquarters carried out the June drill from home, using online conferencing tools.

The content of drills is being reviewed on an ongoing basis in light of the lessons learned from past training drills.

Emergency evacuation drills based on the scenario that a plant tour is taking place when the disaster occurs

The nine Kao plants in Japan that provide plant tours have prepared protective hoods for use by plant visitors in the event that an earthquake occurs while a plant tour is underway. These plants also implement emergency evacuation drills, with employees taking on the role of plant visitors, to ensure that in the event of emergency visitors can be taken swiftly to a safe place. In the future, we will continue to incorporate drills based on a variety of different scenarios during a plant tour into our annual training plan.

Implementing an emergency evacuation drill with employees taking on the role of plant visitors

Process safety and disaster prevention 102-11, 403-2 (Occupational health and safety 2018)

Strengthening process safety and disaster prevention

The SCM Division is actively introducing DX technologies including AI and IoT, and continues to strengthen risk management at chemical facilities through hidden hazard, earthquake and natural disaster response readiness.

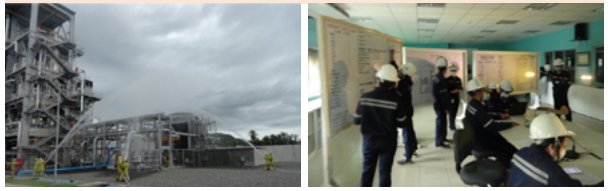
In 2021, we established a thermal risk assessment method to evaluate the prevention of fire and explosion accidents originating in abnormal reactions in our chemical facilities, and implemented safety measures in accordance with the assessment guidelines. We also established fire prevention methods to prevent spontaneous combustion of tank residues, implemented other safety measures to prevent spontaneous combustion, and are continuing to promote awareness of these measures.

We also strive to minimize damage due to natural disasters. In addition to promoting ongoing diagnosis and strengthening equipment racks in our facilities as earthquake countermeasures, we continuously consider measures that may be necessary to prevent structural losses at the Wakayama and Toyohashi plants due to ground liquefaction caused by earthquakes.

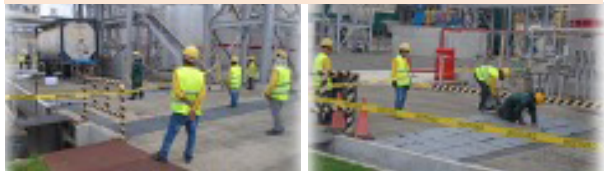
Our activities to minimize damage include incorporating flood risk countermeasures into our basic policy, and in recent years we have been considering wind risk countermeasures to prevent damage to non-structural members such as roofs and external walls.

Our audits of safety, maintenance and other technologies, which are aimed at maintaining and enhancing our global safety level, were conducted remotely due to restrictions on movement imposed by COVID-19.

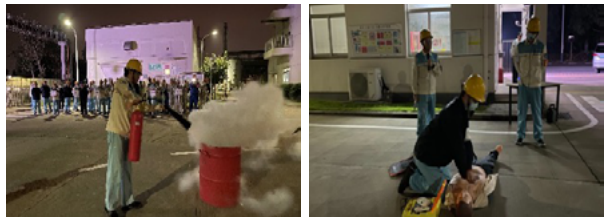
Fire extinguishing training



Traning in dealing with leaks



Fire extinguishing and first aid training at Pilipinas Kao (Philippines)



Nighttime fire extinguishing and first aid training at Kao (Shanghai) Chemical Industries

High-pressure gas safety

High-pressure gas safety inspection, auditing and verification

The Wakayama Plant has been designated an Accredited Safety Inspection Executor* pursuant to the High Pressure Gas Safety Act. In 2021, a safety audit was implemented by the Safety Management in September and a safety inspection under the direction of the President, who also serves as head of safety management, was implemented in November. We were able to confirm that there were no issues with regard to process safety activities.

The high-pressure gas equipment at other Kao worksites also has safety inspection performed by prefectural and external inspection bodies. Safety audit and safety verification for these facilities are also carried out in-house, and a serious effort is being made to ensure safe equipment operation.

* Accredited Safety Inspection Executor
It is a company or organization authorized by the Minister of Economy, Trade and Industry to perform self-inspection, either while equipment is in operation or while it is out of operation, to verify whether the safety of specified items of equipment conforms to the relevant technical standards pursuant to the High Pressure Gas Safety Act.

High-pressure gas safety inspection at the Wakayama Plant

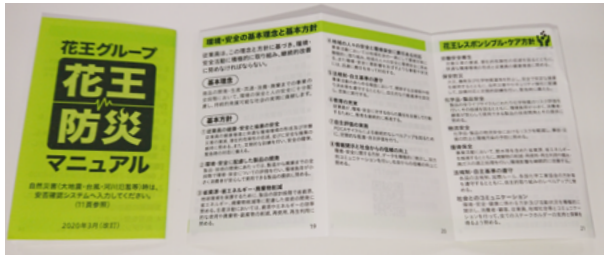
Process safety and disaster prevention 403-5 (Occupational health and safety 2018)

Process safety and disaster prevention educational programs

We create various educational programs for process safety and disaster prevention. For example, the Monozukuri Training Center of the SCM Division is endeavoring to pass on the necessary knowledge and skills to younger technicians, who will be responsible for production sites, by exposing them to simulated technical glitches and hazardous situations.

Promising leaders of the next generation within and outside Japan receive eight months of training to learn about production technology and the spirit of *Yoki-Monozukuri* at Kao's Global Techno School in the Wakayama Plant. This training includes process safety and disaster prevention. In 2021, due to the spread of COVID-19, our Global Techno School activities were conducted entirely remotely.

Every year on Disaster Prevention and Volunteers Day, a disaster prevention message is posted to all employees in Japan to enhance their disaster awareness. In addition, days when accidents occurred are designated as Safety Days, to help ensure that the efficacy of past drills is not weakened by the passage of time. Moreover, the Kao Group Disaster Prevention Manual is distributed annually to all employees in Japan.



Kao Group Disaster Prevention Manual

In 2021, as in the previous year, in response to the increased number of employees working from home due to the effects of COVID-19, we enhanced our e-learning programs, which can also be undertaken at home, and offered them to all employees of our affiliates in Japan.

Following the previous year's basic and hazard map programs, disaster prevention education in 2021 covered dispersed evacuation and the difficulty of evacuation, and encouraged participants to consider their own evacuation plan. The training was held in June, before the seasons of typhoons and torrential rains. The program also trained participants to understand the new warning levels revised this year.

Process safety education in 2021 covered dangerous substances as defined by the Fire Service Act, which is a necessary area of knowledge for employees of companies that handle chemical products and a fundamental element of regulation for companies. We continued the practical education begun in 2020, and trained participants in handling actual dangerous substances as defined by the Act.

Going forward, we will use e-learning actively to carry out process safety and disaster prevention education.