

## Kao's approach

Kao implements 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

As Kao has several large-scale plants, its process safety and disaster prevention needs have been heightened in the current reality of successive accidents at the chemical plants, and the many natural disasters that have occurred recently.

To ensure the safety of local residents, our employees, and others, we will strive to reduce the risk of accidents by ensuring rigorous process safety audits and drills and regular implementation of disaster prevention drills, alongside continuous consideration of appropriate and timely responses when accidents do occur.

### Contributions to the SDGs



## Policies

Activities to ensure process safety and disaster prevention are clearly stipulated in the Kao Responsible Care Policy. This is a policy to "Prevent fires, explosions and leakages involving chemical substances, with due attention to factors such as natural disasters and strengthened security, and responses involving necessary facilities and regular drills to instill disaster preparedness while maintaining safe and stable operations." We are endeavoring to prevent accidents and disasters in accordance with this policy.

## Framework

Our daily activities for process safety and disaster prevention are conducted as part of the Responsible Care 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. In addition, when a large-scale disaster such as a major earthquake occurs, 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 (BCP)\*.

\* Business Continuity Plan (BCP)

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.



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## Education and promotion

Kao implements process safety and disaster prevention education through various programs, to ensure that we deliver in perpetuity on our global commitment to *Yoki-Monozukuri*. By recreating incidents such as technical glitches and hazardous situations at our Monozukuri Training Center, we can ensure that the necessary knowledge and skills are passed on to younger staff members at our production sites.

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 addition, an annual disaster prevention message is posted, and an earthquake and disaster prevention handbook is published to improve disaster awareness. We are also endeavoring to ensure that the efficacy of past drills is not weakened by the passage of time, by designating a Safety Day on days when accidents occurred in the past.

## Collaboration with stakeholders

- Kao regularly implements joint drills with, for example, fire stations and local corporations, in order to keep any damage caused by accidents and disasters which occur to the bare minimum. We are endeavoring to improve the overall level of our disaster prevention activities.
- We jointly implement drills in recognition of the possibility of terrorist attacks in cooperation with local police for our production sites overseas, on an as-needed basis.

## Smart Process Safety Case Studies Collection

The Smart Process Safety Case Studies Collection (published by the Industrial Safety Division of Japan's Ministry of Economy, Trade and Industry), which presents case studies of firms that are at the forefront of efforts to develop "smart" industrial process safety, included a case study of the plant operation optimization support system adopted by Kao Corporation's Wakayama Plant.

This system, which aims to optimize expenditure on utilities, has realized a 1.2% improvement compared to the situation before the new system was adopted. Every morning, meetings are held at which the disparities between the optimal equipment operation recommended by the system and actual operation by plant operatives are discussed. By getting younger employees to think about the reasons for the disparities, and asking more experienced employees to share their views, these meetings provide an effective opportunity for

raising the overall level of operator skill and passing on skills to new generations of employees.

In the future, deployment of this system will be expanded to include other plants, and we will be working to realize centralized data management.



Smart Process Safety Case Studies Collection

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Conservation

Community

Corporate Culture

Governance

## Mid- to long-term targets and performance

### Mid- to long-term targets

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



### Targets and performance

In 2017, we implemented Change Management\*, risk assessments of chemical facilities, regular inspections, and enhanced patrols, for maintenance of safe, stable operations, to eradicate process safety accidents. In addition, detailed implementation specs and plans were also drafted for respective divisions with the targets of enriching disaster prevention drills and enhancing security.

In 2018, 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.

\* Change Management  
Management activities anticipating and accommodating risks before changes are implemented, along with preventive measures for issues such as failure, defects, and accidents.

#### Targets and results

Item	Scope	Indicator	2016	2017		2018
			Results	Target	Results	Target
Accidents	Kao Group	Fires, explosions, leakages, etc. (no. of accidents)	3	0	6	0
		Logistics-related leakage* (no. of accidents)	0	0	0	0

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

Below is an overview of accidents in 2017.  
There were no leakages (on-site) or logistics-related leakages in 2017.

Type of accidents	Small-scale fires: 5 cases	Explosions: 1 case
Overview of accident	<ul style="list-style-type: none"> <li>A fire that started in a garbage collection container.</li> <li>A fire that started in residual hot oil.</li> <li>A fire that started in wood material due to hot air leakage caused by inadequate covering.</li> <li>A fire that started during deactivation treatment of chemicals on which research was being performed.</li> <li>A fire that started near a constant-temperature refrigeration unit in a research laboratory.</li> </ul>	The tank had been almost completely emptied out for cleaning purposes when an explosion occurred, followed by flames (No one was injured, although the windows of a neighboring company did suffer some damage to the glass). Presumed cause: Sediment that had built up in the tank was condensed by evaporation when the tank was emptied, leading to a sudden rise in temperature to spontaneous combustion that caused the explosion and fire.
Countermeasures being taken	We are working to implement thorough management of our rules for dealing with waste reagents, as well as operations processes and construction work.	Based on the presumed cause, we overhauled our procedures for cleaning the inside of waste tanks and striving to prevent recurrence.

## 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 workplaces, the group also conducts 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

In 2017, company-wide training was held over two days in March as in previous years and for a one-day (24-hour) period in September, on inputting data into the employee safety confirmation system for use in confirming the safety of all Kao Group employees. In both training instances, the successful data inputting rate was 100%. A 100% score has now been achieved seven times in a row since September 2014. We will continue to implement this type of training in the future.

#### Company-wide earthquake scenario reporting and communication training

Recognizing the possibility of damage to the Kao Head Office from a major earthquake in the Tokyo metropolitan area, the group is consolidating its organizational units for disaster response in Eastern Japan and Western Japan.

In May 2017, we implemented drills in the Tohoku and Hokkaido regions premised on a major earthquake on the Sanriku coast, and in November we implemented drills premised on a major earthquake with its epicenter directly under the Tokyo metropolitan area.

For the 2017 drills, it was assumed that the earthquakes occurred while employees were at home on the weekend or at night. With respect to the main organizational units for disaster response, the contact methods used were reviewed, with the adoption of new contact methods (using IP wireless technology.)

During these drills, disaster sites transmitted timely information about human safety and property damage status by means of a meeting system utilizing satellite phones and Kao's internal disaster response bulletin board and website, and necessary responses were implemented based on the data from organizational units for disaster response. 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 an 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.



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## Disaster prevention audits

In 2017, the scope of implementation of disaster prevention audits was expanded from eight plants in six countries to ten plants in eight countries, with the addition of the U.S. and Mexico plants. Audits were implemented at five plants in 2017, in the U.S., Mexico, Malaysia, Indonesia and the Philippines. Disaster prevention audits cover the state of implementation of disaster prevention operations, and the improvements made to address safety and disaster prevention issues. When issues are identified during audits, appropriate measures are taken to respond to these issues.

Initiatives including the implementation of audits by having dispatched auditors from particular plants to other plants are also continued so that we can improve the levels of safety and disaster prevention at each plant through audit.

## Strengthening process safety and disaster prevention

The SCM Division is working to strengthen chemical equipment risk management by identifying latent risks and implementing suitable measures in response, as well as continuing to promote earthquake response measures.

In 2017, latent risks were again identified by means of chemical equipment safety assessments and we continue to implement measures to prevent fires involving low-flashpoint substances, dust explosions, and spontaneous combustion, measures to ensure the safety of equipment used for polymerization and exothermic reactions and to strengthen the change management of equipment. With regard to earthquake response measures, we have promoted the implementation of seismic resistance diagnostics and reinforcement for both buildings and equipment stands, liquefaction prevention measures, and measures to strengthen protection against tsunamis.

## 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 2017, a safety audit was implemented by the Safety Management Division in August and a safety inspection under the direction of the President, who also serves as head of safety management, was implemented in October. We were able to confirm that there were no issues with regards to process safety activities.

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



High-pressure gas safety inspection at the Wakayama Plant

\* 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.