

Responsible Care 1998 Annual Report

President's Report

The Japan Responsible Care Council

Akira Miura



I am pleased to present the JRCC Responsible Care Report 1999, introducing the activities of the member companies and their achievements during April 1998– March 1999 (fiscal year 1998).

The communication with the public and transparency are key important principles strongly requested by the society these days. This reflects the rising concern over the effect of chemical substances on Environment, Safety and Health. It is strongly requested for the chemical manufacturers to manage such chemical substances open to the public.

JRCC Responsible Care Report 1999 was published, based on the keynote code of presentation "principle of continuity" and "presentation by data", so as to obtain the confidence from the public through transparency. Voluntary initiatives of JRCC and member companies including dialogue with the community and international collaboration are introduced with a special emphasis on Environment, Safety and Health. Our Responsible Care performances in fiscal year 1998 (April 1998–March 1999) achieved the following results:

- 1) Member companies increased to 106 as of August 1999 from 74 at the time of JRCC's launch in 1995.
- 2) The continued effort to have a dialogue with the public is one of the field where JRCC most aggressively worked in this year. As part of such effort a number of seminars and workshops were held to be participated by the local community and the consumer. The second series of the regional meetings has started at the 9 petrochemical complexes and other areas throughout Japan.
- 3) JRCC encourages member companies to make reports of their RC voluntary initiatives. 41 member companies have published RC reports, among which some companies' factories have published independent reports on their RC performances.
- 4) Responsible Care performances of member companies have been improved steadily as data show.
- 5) There are 45 nations participating in RCLG (Responsible Care Leadership Group) of ICCA (International Council of Chemical Associations). Global collaboration through ICCA is a field where JRCC aims to learn and exchange views with other countries concerning RC. In addition JRCC participated in ILO 99 and our delegation successfully made a presentation on RC achievements in Japan.

Further openness and transparency are requested for RC reports including PRTR (Pollutant Release and Transfer Register) and Environmental Accounting in near future. JRCC will continue to make all its efforts to achieve better RC through voluntarily data publication.

October, 1999



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Message from the Advisory Board

he Japan Responsible Care Council Advisory Board

Jiro Kondo



Of late years a day hardly passes without an article concerning dioxins or other chemical substances in the newspapers. This frequency implies particular significance of chemical substance management among environmental issues. The maximum safe dioxin level in the human body is said to be 4 picograms (one trillionth of gram) per human body kilogram. At the very least environmental regulations should ensure that this level is not reached. Needless to say, it is too late and it has no meaning to discuss about the degree of concentration once they are absorbed into human bodies. Fortunately there has been no reported case of dioxin induced

sickness in Japan.

It is strongly requested nowadays that the companies which manufacture and use chemicals should take voluntary actions to ensure that hazardous substances are not released into the environment. This is the essential nature of Responsible Care.

PRTR was promulgated in Japan. There had been some reported conflicts between Environmental Agency and MITI (Ministry of International Trade Industry) for the introduction of new PRTR system. Both parties, however, finally cooperated together to the better results. It will be ideal if environment is protected and human health is kept completely safe only by companies. It is worthy, still in such case, to keep accurate records. Occasionally chronic analysis requires the past environmental data.

It is my great pleasure that JRCC Responsible Care Report 1999 is published. I would like to express my hearty gratitude to all the participants who have contributed to this publication. Chemical industry is rather hard to understand for non-professional citizens and only chemists can prepare the accurate reports. I sincerely delight that JRCC members continue to increase to the development of these industry voluntary initiatives.

As we approach toward 21st century, the global environmental problem such as climate change will become more serious in addition to the population growth and environmental destruction in developing countries. Scientific technologies are fundamental and indispensable to overcome these global problems. While science contributes much to the better quality of life, a careful attention needs to be paid to the other aspect of science which may bring potential dangers on human beings.

A handwritten signature in cursive script that reads "Jiro Kondo".

Responsible Care 1998 Annual Report

Summary of the 1998 Responsible Care Annual Report

This is JRCC's 4th annual report.

Features of the 1998 annual report:

- The report is an overview and summary of the fiscal 1998 activity reports of 90 of JRCC's members, which numbered 106 companies as of April 30 1999.
- The quantitative presentation of RC activities has been compiled on the basis of performance data supplied by JRCC member companies, while the qualitative presentation of RC activities has been compiled on the basis of written reports of 1998 JRCC activities, including surveys carried out among JRCC member companies.
- The accuracy of data included herein has increased due to an increase in the data provided and revision of member data.
- The terms of activities listed herein are primarily fiscal 1998.
- Sales figures for this year declined in comparison with the previous fiscal year. Thus, although improvement is evident for each objective, unit level figures for each objective have worsened slightly.

Summary

Environmental Preservation

- As the volume of industrial waste is being reduced, the ratio of recycling is being increased, resulting in total reduction in the volume of final waste disposal.
- Although overall energy conservation and the reduction of carbon dioxide emissions were achieved, figures worsened slightly on a unit basis.
- The objective of an overall 30% reduction in emissions of harmful air pollutants over fiscal 1995's figures was met with a 35% reduction.
- Emissions of SO_x, NO_x, COD and dust have been brought within regulatory limits.

Environmental Investment

- Funds invested in environmental measures are increasing annually.

Process Safety & Disaster Prevention

- Compared to the first half of the 1990s, the average annual number of accidents at member companies has risen slightly, although figures are leveling off for the latter half of the 1990's.

Occupational Safety and Health

- The frequency rate of work-related accidents at member production facilities was 0.54 and the severity rate of accidents 0.115. Starting this year, the number of fatalities will also be listed.

Product Stewardship

- The number of safety assessment of chemical substances per member company reached 236, while the average rate of Material Safety Data Sheet (MSDS) preparation, the rate of MSDS distribution to clients, the comprehension of client application, and the average rate of Emergency Response Card preparation all rose to 98%, 91%, 89%, and 90% respectively.

Dialogue with the Community

- Second series of regional RC meetings were held at the sites of 3 petrochemical complexes.
- Dialog meetings with consumers NGOs were newly held.

- The number of RC reporting member companies reached 41, and JRCC's homepage now has links to 27 members' reports.

Global Networking

- RC is now implemented in 45 countries.
- JCIA attended the annual RC Leadership Group meeting and are engaged in international cooperation in RC activities.

Activities in 1998

- Reduction of the burden on the environment has been regarded as one of the key themes of annual plans and reports, and risk assessment and RC activity reports issuance are also becoming increasingly important.
- RC internal audit systems and educational systems indicated that 75% and 68% of member companies have adopted and have satisfactory systems in operation respectively.
- Results of our membership surveys indicate that 90% of members have prepared emergency manuals and communications systems as a safeguard against transportation accidents, and 80% of members have established reciprocal support systems. Good progress has also been made with ISO certification and a half of our member companies now being certified in ISO 14000.

Recent Chemical Safety Topics

- We are introducing on HPV chemicals and LRI issues in the world and Japan.

JRCC Activities

- We have included in the report the main 1998 activities, both domestic and internationally, as well as the recommendations of the JRCC Advisory Board regarding future issues that should be addressed.

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Role of the RC Annual Report

Dialogue Between JRCC and Society

The RC Annual Report is just one of the many ways in which JRCC communicates with society. The following are some of its means of public relations and communications:

- RC Annual Report (Japanese and English)
- General Annual Report
- Quarterly JRCC Newsletter
- RC Regional Meetings (at several sites annually)
- Public Forums or dialog meeting with citizens (once to twice annually)
- Sponsorship and/or participation in RCAP and RCLG
- JCIA web site (year long)

Of these, the RC Annual Report is a highly data-oriented approach, and as such contains a relatively strong specialized element. The purpose of the report is as follows.



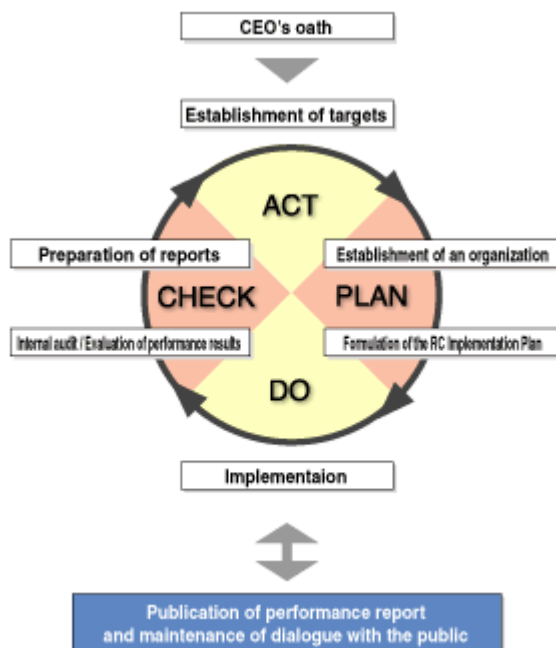
Purpose of the Annual Report

Reciprocal confirmation of progress between members

This report is a summary of the performance data on environment, health and safety (EHS) provided to JRCC by members annually. Each member regularly gathers and organizes data, which is used as a foundation for improving their performance. This span of this data is extremely wide due to the business practices, geographical and social conditions of their location, and their scale. The knowledge gleaned from this data enables each member to comprehend their own standards for EHS and makes future improvement possible.

Communicating the JRCC accomplishments to interested parties in the chemical industry

The chemical industry of its own volition seeks to control and minimize the environmental risks caused by chemical substances, from raw material procurement, through product manufacturing, processing, and use, to final disposal. The passing on of these efforts to parties in related industries and the fostering of understanding and cooperation is necessary proper use of chemical substances at the societal level.



**Providing fresh information to individuals
with interest in chemicals**

This report may be useful for informing them of our recent progress and then, increasing them more profound understanding of the chemical industry.

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Glossary

RC (Responsible Care)

Activities undertaken by the chemical industry by which manufacturers and handlers of chemical substances, under the principle of self-determination and individual responsibility, conduct self-management of environmental and safety issues surrounding aspects of chemical substances, from development through disposal.

ICCA (International Council of Chemical Associations)

RCLG (Responsible Care Leadership Group)

HPV (High Production Volume) Chemicals

An OECD program for collecting and evaluating SIDS (Screening Information Data Set) on chemical substances whose production volume exceeds 1000 tons per country. For details, please refer to page 21

LRI (Long-range Research Initiative)

A voluntary long-term plan to study the effects of chemical substances on health, safety, and the environment, one of ICCA's most crucial agendas. For details, please refer to page 22

JCIA (Japan Chemical Industry Association)

JRCC (Japan Responsible Care Council)

An organization established within JCIA in 1995 for the promotion of RC in Japan.

RCAP (Responsible Care Asia Pacific Conference)

An annual event that started in 1995 in Hong Kong

PRTR (Pollutant Release and Transfer Register)

A PRTR is an environmental database or inventory of potentially harmful release to air, water and soil as well as wastes transported off site for treatment and disposal.

MSDS (Material Safety Data Sheet)

A safety data sheet for chemical products, SDS, gives information on various aspects of these chemical products (substances or preparations) concerning EHS protections. The SDS supplies for these aspects, basic knowledge of the chemical products and gives recommendations on protective measures and emergency actions.

NO_x (Nitrogen Oxides)

SO_x (Sulfur Oxides)

COD (Chemical Oxygen Demand)

BOD (Biochemical Oxygen Demand)

COP3 (3rd Conference of Parties to the UN Framework Convention on Climate Change: Kyoto)

A conference to determine each country's acceptable quantities of CO₂ and other substances released into environment for global warming.

Yellow Card

Common name for the Emergency Response Card on transportation of toxic and hazardous materials. Please refer to page 20.

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Environmental Preservation (Reduction of Industrial Waste)

Plans for Reduction of Industrial Waste

Progress of Members with Quantitative Targets

Year of survey	1997		1998	
Planned reduction year	2000	2010	2000	2010
Member companies with reduction plans	72	64	74	77
Ratio of the above companies	79%	70%	82%	86%
Companies supplying data	91	91	90	90

The reduction of industrial waste is being approached from a long term perspective. –Our 1998 survey showed that more than 80% of member companies have made plans for the reduction of industrial waste by 2000 and or 2010. –In particular, the number of companies that have made plans to reduce waste by 2010 increased substantially compared with the previous fiscal year.

Details of Waste Reduction Plans

	JRCC Member Companies ¹ Results and Targets			JCIA Voluntary Environmental Action Plan
	1990 Results	2010 Target	2010 Target based on 1990 level	2010 Target based on 1990 level
Recycling Rate (%)	28%	48%	71% increase *1	–
Improvement in Recycling Rate (%)	–	–	47% *2	15%
Final Disposals at Off-Site Landfills (t/y)	1,080,120	444,908	59% decrease *3	40% decrease

* 1: $(2010 \text{ rate} - 1990 \text{ rate}) / 1990 \text{ recycling rate} \times 100 (\%)$

* 2: $(2010 \text{ amount} - 1990 \text{ amount}) / 1990 \text{ recycled amount} \times 100 (\%)$

* 3: $(1990 \text{ amount} - 2010 \text{ amount}) / 1990 \text{ final disposals amount} \times 100 (\%)$

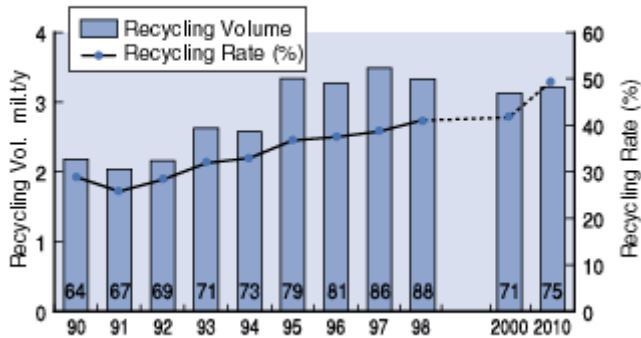
Targets have been set at 71% for increases in the rate of recycling and 59% for the reduction in final disposals at off-site landfills.

Member companies¹ 2010 targets for increased recycling and decreased final disposals at off-site landfills are both set at higher levels than those stipulated in the JCIA Voluntary Environmental Action Plan.

Waste Disposal and Current Performances

According to 1998 data, approximately 71% of industrial waste generated by members are disposed of by in-house recycling and waste-volume reduction. Moreover, by including waste processed by contractors utilizing similar methods, the final disposals at off-site landfills were reduced to 9%.

Recycling Volume & Rate (JRCC)
(in-house and by contractors)



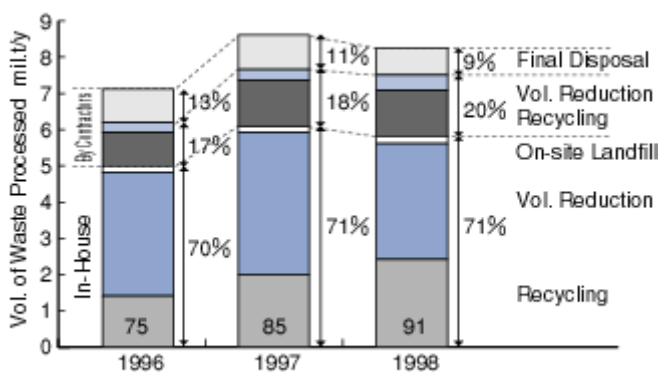
Note: Numbers on bar graph indicate the number of members reporting data.

While aiming to make more efficient use of materials through increased recycling, members are reducing the volume of industrial waste for final disposals at off-site landfills and working to lessen the environmental impact of industrial waste.

Recycling Rate = (In-house + contracted recycling amount) / total waste output

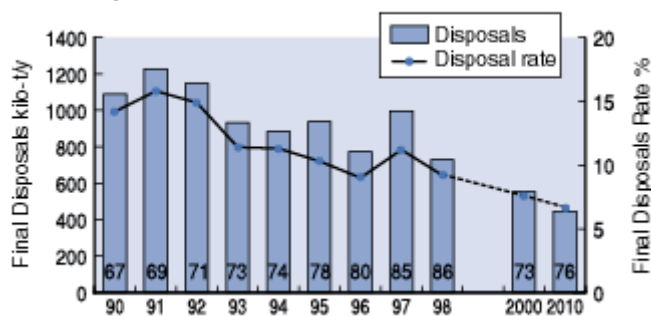
Off-site Landfill Disposal Rate = (Off-site landfill disposal amount) / total waste output

Industrial Waste Processing (JRCC)



Note: Numbers on bar graph indicate the number of members reporting data.

Final Disposals and its Rate at Off-Site Landfills (JRCC)



Note: Numbers on bar graph indicate the number of members reporting data.

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Environmental Preservation (Energy Saving, CO2 Gas Emission Control)

The number of members with energy-saving plans reached 41 in 1998. To respond to the problem of global warming, every member company has a medium-term plan in place aimed at implementing further energy conservation measures.

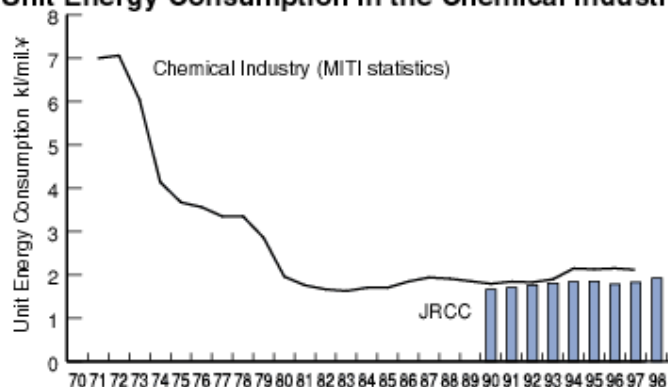
An increase in production output will not help Japan achieve this CO2 emission reduction target. Accordingly, each member company of JRCC is making efforts to reduce unit energy consumption to 90% of 1990 levels by 2010, as recommended by the JCIA Voluntary Environmental Action Plan.

As can be seen from the figure, since the 1970s the Japanese chemical industry has succeeded in making significant progress in energy conservation. Although increased production in the chemical industry since 1990 has given rise to increased overall energy consumption, consumption on a unit base has leveled off or shown only a slight increase.

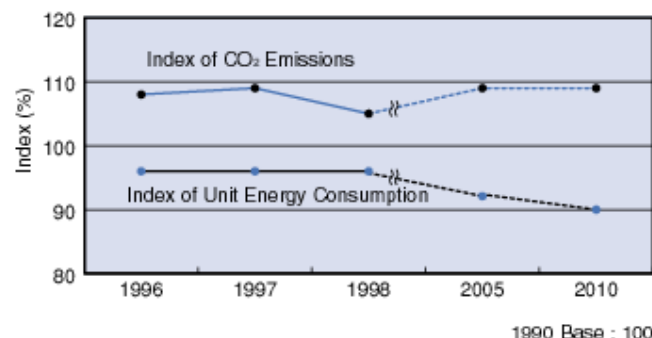
The backdrop to these trends includes the higher energy consumption associated with upgraded higher-quality products as well as the reduction in the cost of these products. However, the leveling off of energy consumption on a unit basis has been achieved due to the dedicated efforts of member companies.

JRCC members are working to reduce unit CO2 emissions in response to global warming. Although energy consumption and total emissions declined in 1998, as a result of decreased sales amount, unit emissions actually increased slightly.

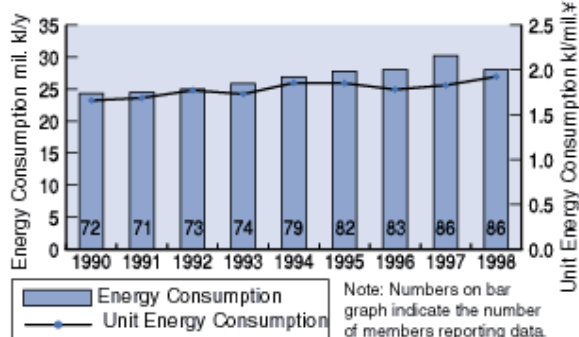
MITI's Statistics on Unit Energy Consumption in the Chemical Industry



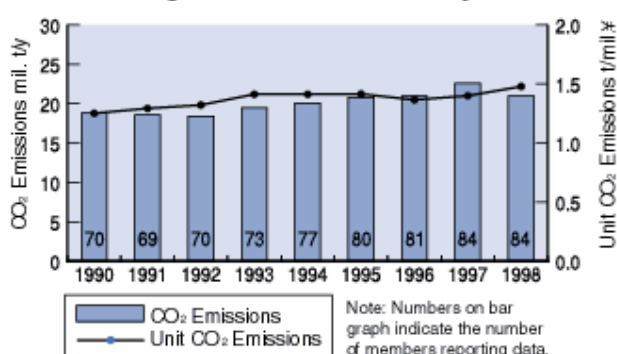
Trends and Forecasts in Unit Energy Consumption and CO2 Emissions (JCIA)



Energy Consumption (as crude oil) (JRCC)



CO2 Emissions (as Carbon), Including Purchased Electricity (JRCC)



Reference

It was decided at the COP3 conference held in Kyoto in December 1997, that Japan would reduce its emissions of greenhouse gases, including CO2, 6% compared to 1990 levels. At the COP4 conference held in Buenos Aires in November 1998, an action plan to achieve this target was adopted.

Reference

JCIA Voluntary Environmental Action Plan (Nov. 1996)
The chemical industry will work to reduce unit energy consumption to 90% of 1990 levels by 2010.

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Environmental Preservation (Air Pollutants Management and PRTR)

The Management of Air Pollutants Emissions

Members are pushing forward with voluntary measures to reduce their airborne emissions of 12 chemical substances. Although there is some variation among the reduction rates of individual chemical substances, the JRCC plan calls for a 30% reduction from 1995 levels by the end of 1999.

Total airborne emissions of the 12 substances have declined steadily each year, and fell 20% in 1998, to 12,980 tons. This represents a 35% drop from the level in 1995, thereby reaching the reduction target for 1999 a year ahead of schedule. In particular, emissions of acetaldehyde, trichloroethylene, and formaldehyde have fallen by more than 50% since 1995.

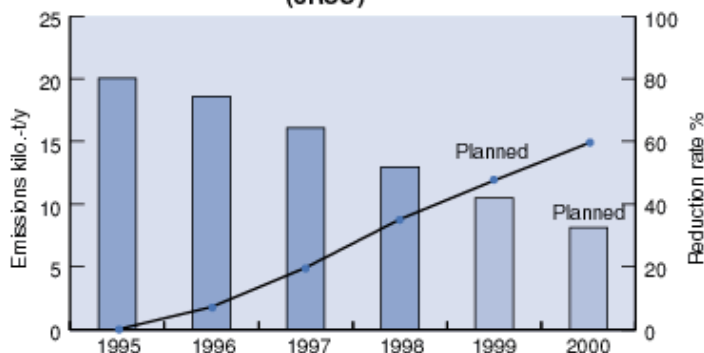
Based on PRTR records surveyed by JCIA, by pollution category (airborne, public water supply, and soil) airborne emissions account for 96.5% of total emissions and public-water-supply emissions for 3.5%.

Following the Voluntary Plan for Air Pollutants Management—The PRTR System

On July 13, 1999, so called the Chemical Substances Emission Management Promotion Law was promulgated to establish a new administrative regime that will require companies to record quantitative data on chemical substances from 2001 and provide this information to government authorities from 2002.

For JCIA/JRCC members, the progression from the current voluntary management system to a regulated system is a natural one. The PRTR system is intended to raise the public's reliability in the safety of chemical industry activities by requiring companies to take active measures to control

Total Air Emission of 12 Chemical Substances (JRCC)



Note: The 12 chemical substances were selected from the list of 22 harmful air pollutants to be given the highest priority, which was compiled by the Central Environmental Council. These specified chemical substances are considered particularly harmful and present a relatively high risk to human health and the nation's air quality.

Reference

The PRTR system aims to provide a reporting system that the authorities can use to evaluate chemical risk and to offer information as well as a forum for communication with local communities regarding chemical risk. In addition, it enables objective evaluation of companies' emission reduction through increased unit efficiency and their efforts to improve the environment.

History of JCIA Voluntary PRTR	
1992	Survey of overseas PRTR systems Pilot survey (13 substances)
1993	Pilot survey (28 substances)
1994	Establishment of survey guidelines
1995	1st survey (55 substances)
1996	2nd survey (152 substances) 55 substances announced at the Chemical Product Council
1997	3rd survey (286 substances) 152 substances announced
1998	4th survey (284 substances) 163 substances announced

Reference

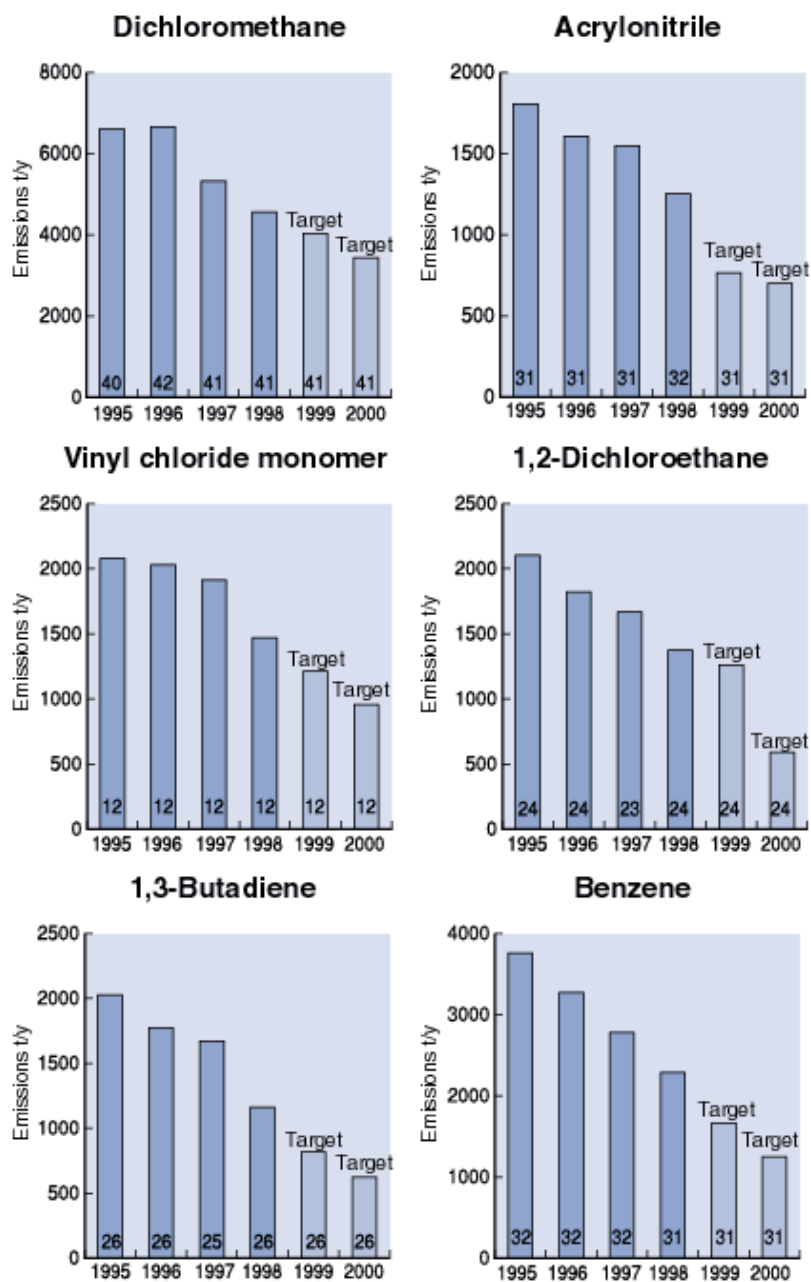
The Environment Agency in 1997 piloted a scheme relating to 178 substances.

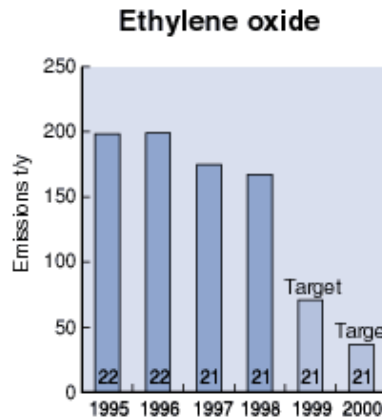
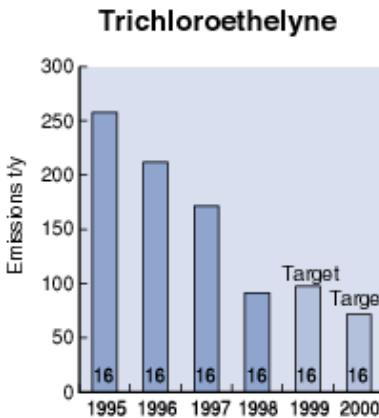
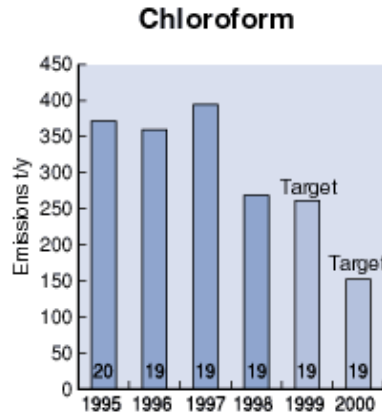
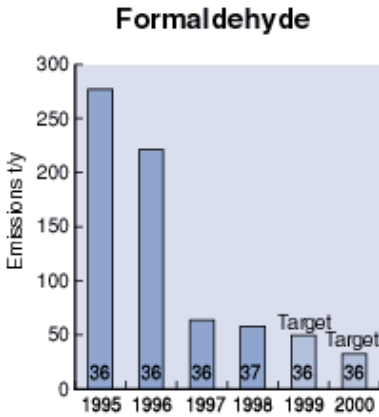
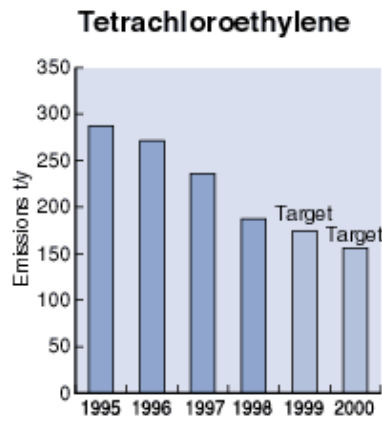
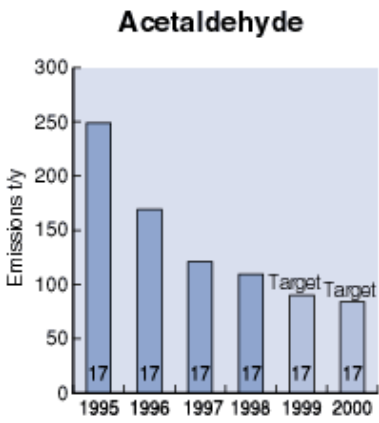
Keidanren, the Japanese business federation, in 1997 pledged cooperation with the JCIA's manual, which lists 174 chemical substances.

chemical substance emissions, including closing unsafe points in facilities, raising recovery and recycling rates, reducing the use of hazardous substances, and switching to alternative substances.

Risk communication, whether it be under the RC ethos of voluntary management or the regulated PRTR system, is extremely important to secure public reliability. JRCC will continue to promote emission reduction and reporting measures that achieve this goal.

Emissions of 12 Substances (JRCC)





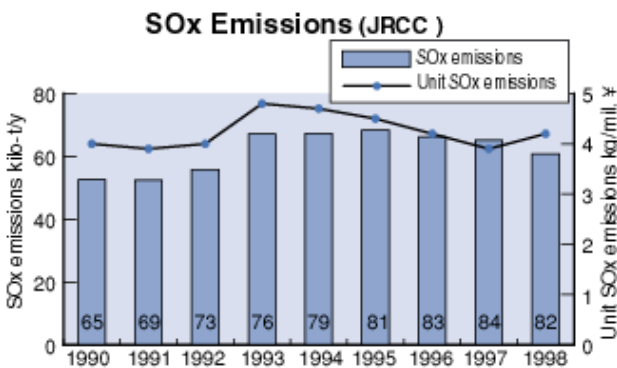
Note: Numbers on the bar graphs indicate the number of members reporting data.

Environmental Preservation (Air and Water Quality)

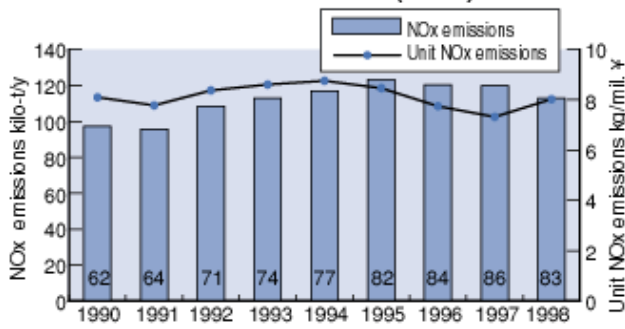
SOx and NOx emissions : Total emission volume has exhibited a slight increase ; however, unit emissions have remained stable.

COD emissions : Both total emission volume and unit emissions have remained stable.

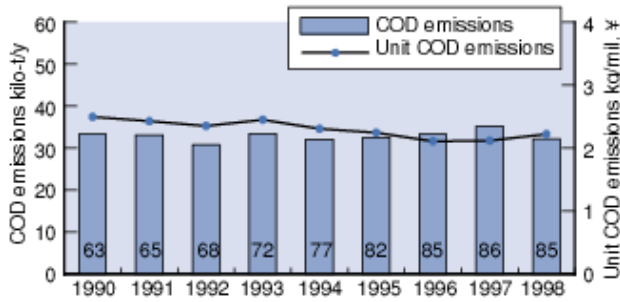
Dust emissions : Total emission volume has increased slightly ; however, unit emissions have remained stable



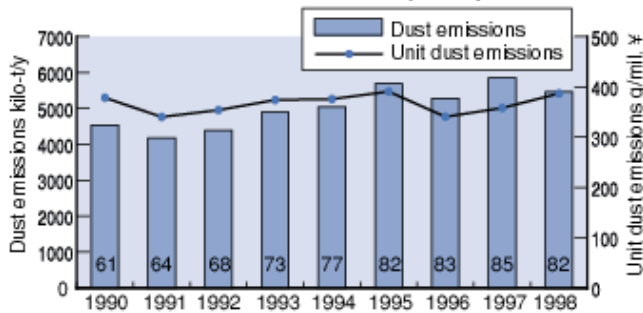
NOx Emissions (JRCC)



COD Emissions (JRCC)



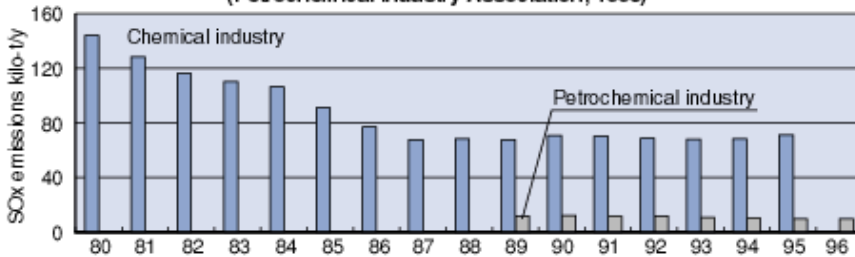
Dust Emissions (JRCC)



Note: Numbers on the bar graphs indicate the number of members reporting data.

SOx Emissions by the Chemical Industry and Petrochemical Industry

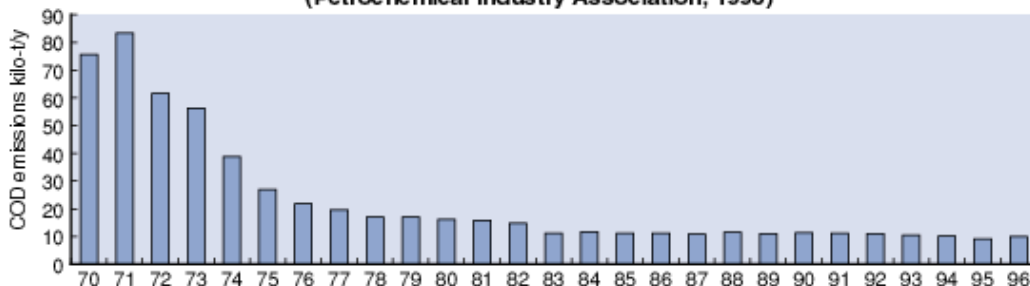
(Progress in Implementation of Environmental Measures by Petrochemical Industry, Ver. 2)
(Petrochemical Industry Association, 1998)



In the 1970s, the chemical industry achieved large-scale reductions in these emission items. Since 1980, continuous efforts to improve control measures have kept emissions at low levels. Looking ahead, further reduction and control measures are required to keep emissions at low levels.

COD Emissions by the Chemical Industry and Petrochemical Industry

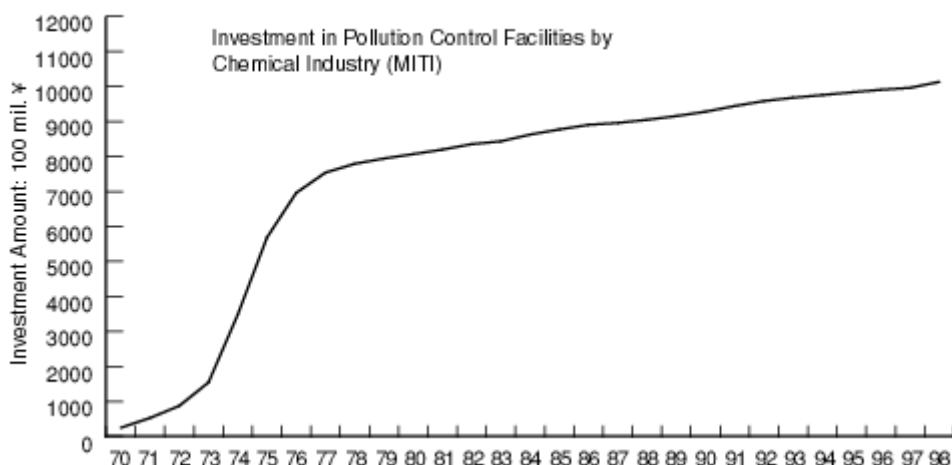
(Progress in Implementation of Environmental Measures by Petrochemical Industry, Ver. 2)
(Petrochemical Industry Association, 1998)



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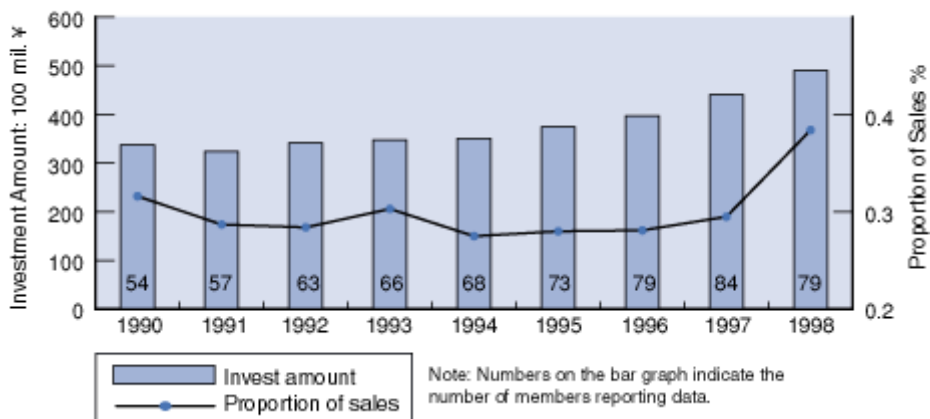
Investment in Environmental Preservation

Cumulative Investment in Pollution Control Facilities



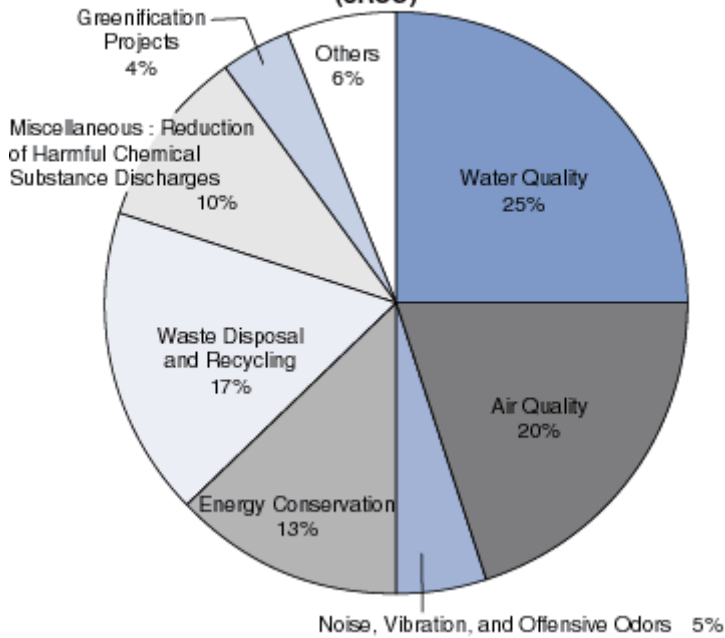
During the 1970s, the chemical industry invested heavily in pollution-control equipment and facilities. Consequently, the nation's air and water quality improved rapidly.

Investment in Environmental Preservation (JRCC)



Since 1990, members have consistently invested ¥30 to ¥40 billion in environmental preservation measures annually. In 1998, this level of investment was equivalent to an average of 1600 million a company, or 0.4% of sales amount.

Investment in Environmental Preservation for 1998 (JRCC)



The recent environmental preservation investment pattern of members illustrates the broad range of issues being addressed. Investments are being made in the following areas:

- Improvement of water and air quality and the reductions of noise, vibration, and offensive odors;
- Waste disposal and recycling;
- Energy saving and reduction of CO₂ emissions;
- Reduction of hazardous chemical substance emissions; and
- Greenification

The introduction of environmental accounting systems will improve the quality of information provided on investment in environmental activities.

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Process Safety and Disaster Prevention

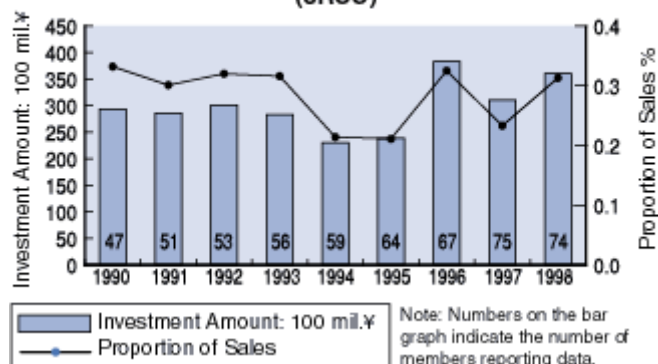
The average annual frequency of accidents at the production facilities of 88 members was 0.4 cases in 1998, remaining at the same level for the last four years.

In 1998, 74 members invested I\$36.0 billion in process safety and disaster prevention. The breakdown of this investment is as follows: replacement of superannuated facilities, 34%; workplace safety measures, 31%; explosion, fire, and leakage prevention measures, 23%; earthquake countermeasures, 8%; and others, 4%.

In 1998, 76 members conducted an average of 49 advance facility safety assessments, maintaining the high inspection levels of previous years.

Defective plant or equipment and human error are the two main causes of accidents at chemical facilities. Recent advances in technology have greatly increased the reliability of plant and equipment. However, the design and implementation of workplace safety management systems that minimize the potential for human error are issues that need further attention. JRCC members are working to improve operating safety levels through such measures as sharing information on accident causes to prevent repeat occurrences, educating employees on safety matters, preparing safety manuals, and conducting advance facility safety assessments.

Investment Trends in Safety and Disaster Prevention (JRCC)



Establishment of Guidelines for Process Safety and Disaster Prevention

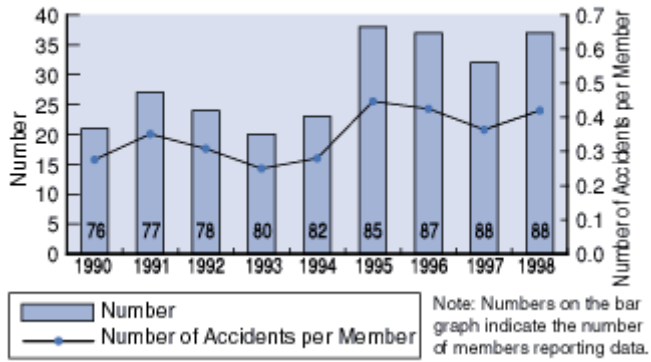
The JCIA has established Guidelines for Process Safety and Disaster Prevention as part of its voluntary efforts for prevention of explosions, fires, and hazardous substance leaks at plant facilities. The guidelines include information on basic safety technologies and disaster prevention measures.

Progress of Accidents at Petrochemical Complexes

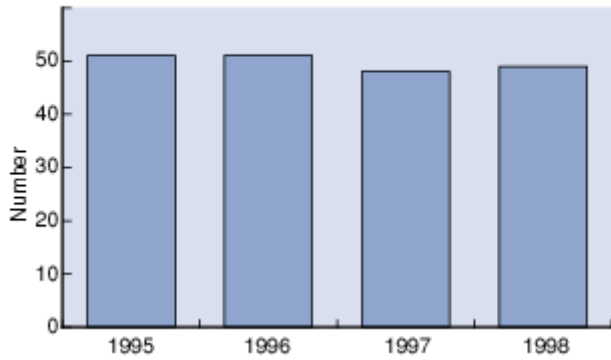
(Regions involved in the accident prevention law for petrochemical complexes)

Source	Accident Type	90	91	92	93	94	95	96	97	98
High Pressure Gas Safety Institute	Explosions, fires, eruptions, ruptures, plant destruction	5	7	2	6	6	7	8	7	13
Fire & Disaster Management Agency	General accidents (fires, explosions, leaks)	63	56	53	45	61	67	93	76	-

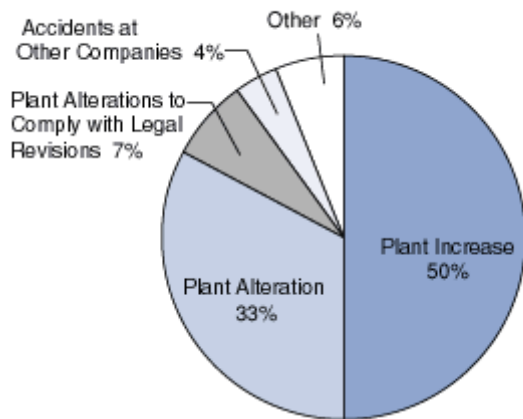
**Number of Accidents at Plant Facilities (JRCC)
(explosions, fires, leaks)**



**Number of Safety Assessments of Plant Facilities (JRCC)
(data from 80 members) Average Number per Member**

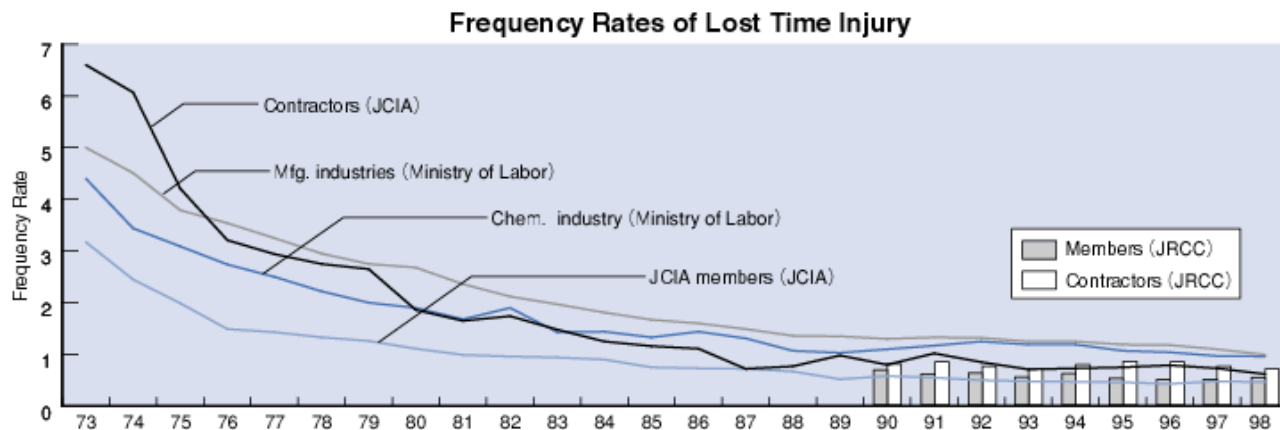


Breakdown of Plant Safety Assessments (JRCC)



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Occupational Safety and Health



Surveys conducted by the Ministry of Labor and JCIA indicate that the frequency rate of lost time injury has been continuously falling since the 1970s. This is a direct result of the persistent efforts in the area of occupational safety by all companies in the chemical industry. The frequency rates of members and their contractors are approximately equal to the JCIA survey figures and are below the Ministry of Labor survey levels.

Number of Fatalities by Labor Accidents

Corresponding to the international statistics trends by such ICCA and RCLG, the number of fatalities by labor accidents is newly reported from 1998 as well as parameters of the frequency rate and severity rate.

	1996	1997	1998
Member companies (JRCC)	3	3	3
Member's contractors (JRCC)	7	4	5
Chemical industry (MOL)	39	34	-
Manufacturing industries(MOL)	405	351	305

MOL: Ministry of Labor

Establishment of Guidelines for Preventing Accidents by Contacting with Hazardous Substances

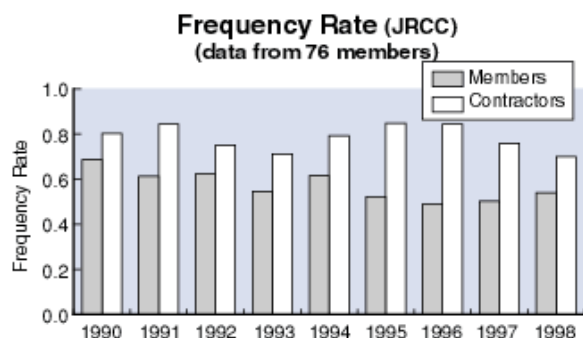
At 20%, injuries occurring by contact with hazardous substances account for the second largest percentage of labor accidents among JCIA member companies. In 1998, JCIA established Guidelines for preventing Accidents by Contacting with Hazardous Substances, thereby contributing to improve RC activities following establishment of Guidelines for preventing Accidents by being Caught or Trapped in 1997, which accounts for the largest percentage of labor accidents.

Revision of Occupational Health and Safety Regulations

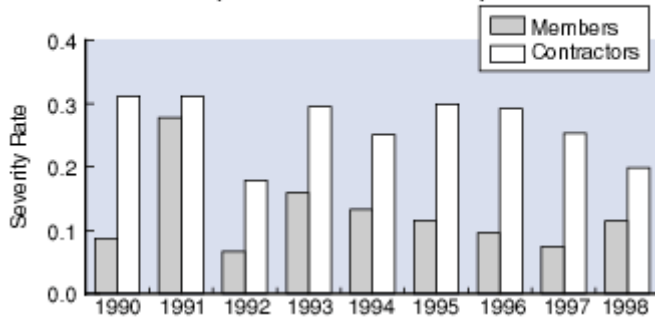
The Occupational Health and Safety Law has been revised to raise health management standards for night-shift workers and ensure the use of MSDSs. Also, the Ministry of Labor has officially announced occupational safety and health management system guidelines with a view to raising safety level.

Revision of Occupational Safety and Health Management Guidelines

JCIA has revised Guideline on Occupational Safety and Health Management System based on the code for implementation of RC in order to ensure implementing a PDCA cycle.



Severity Rate (JRCC)
(data from 76 members)



$$\text{Frequency Rate} = \frac{\text{number of injured persons}}{\text{total working hours in one million working hours}}$$

$$\text{Severity Rate} = \frac{\text{lost days}}{\text{total working hours in one thousand working hours}}$$

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Product Stewardship

Examples of Product Stewardship Activities

The following activities are conducted in development, production, distribution, use and final consumption, and disposal stages.

Providing Information :

Provision of MSDSs; Carrying of Emergency Response Cards (Yellow Cards); Labeling information on product safety;

Chemical Product Information Database established in April 1998 (<http://www.jcia.net.or.jp>); Seminar on transportation safety management of dangerous goods on road held in November 1998

Data Analysis :

PRTR, data analysis based on environment and safety research by JRCC

Safety Assessments :

Conducting safety assessments of chemical substances and production facilities; Risk Assessment System (JCIA), Revised Initial Risk Assessment Procedures published March 1998 in conjunction with a series of explanatory lectures; Seminars on PRTR and Risk Communication and Risk Assessment System research held in December 1998

Safety Management :

Promotion of voluntary plans for air pollutant control; Promotion of risk management and risk reduction plans; Promotion of disaster prevention measures;

Revision of Occupational Health and Safety Management Guidelines in November 1998;

Preparation of Disaster Prevention Guidelines in March 1999;

Revision of Transportation Safety Management Guidelines in March 1999

Results of Chemical Substance Safety Assessments

Number of Safety Assessments:

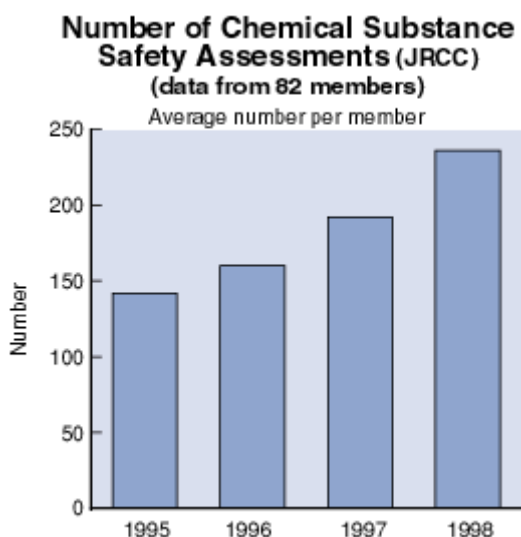
In 1998, 82 members undertook an average of 236 chemical substance safety assessments at stages of the development of new chemicals, production and use.

Reasons for Safety Assessments:

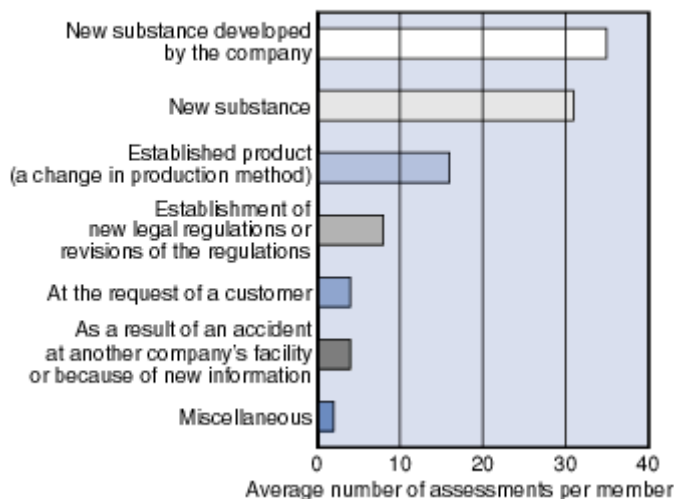
The chemical substance safety assessments, which are applied to established products as well as new chemical substances, focus on the effects which chemical substances have on the people handling them and the environment.

Code of Implementation of Safety Assessments:

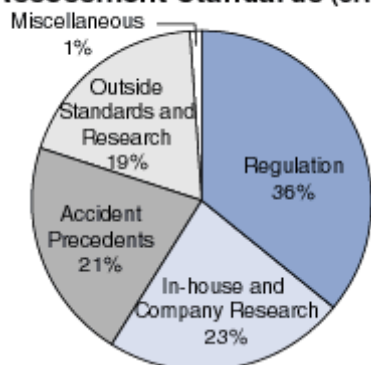
Of 82 members, 90% have their own safety assessment codes.



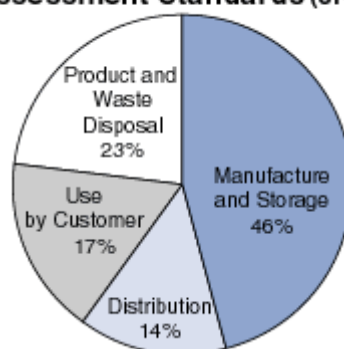
Reasons for Conducting Substance Safety Assessments (JRCC)



Basis of Safety Assessment Standards (JRCC)



Breakdown of Safety Assessment Standards (JRCC)



Reference

The results of 4th survey on Risk Assessment of Chemical Substances by JCIA in November, 1998 show that 89% of chemical companies and 98% of JRCC members conducted this kind of assessment.

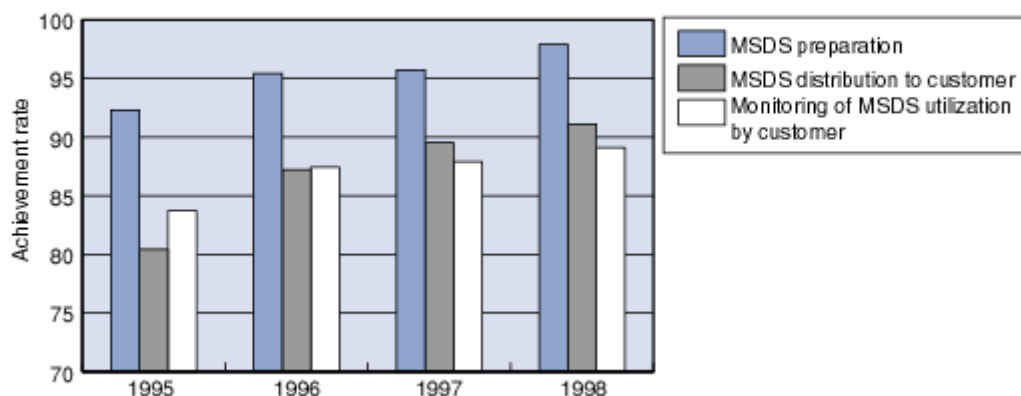
Status of Material Safety Data Sheet (MSDS) Preparation

The MSDS preparation rate has reached 98% (data from 87 members).

The MSDS customer distribution rate has improved to 91% (data from 55 members).

The monitoring rate of MSDS customer utilization has improved to 89% (data from 69 members).

Status of MSDS Preparation (JRCC)(data from 87 members)



Hazardous Chemicals Requested for Safety Data Sheets in Japan Have Been Completed

The average number of MSDSs published by 87 members increased to approximately 2,600 (preparation rate: 98%). In addition, many members published MSDSs on low-hazard chemical substances, including those not covered by the SDS notification requirements. 23% of MSDSs were translated into foreign languages.

Revision of MSDS Contents

A total of 96% of members have reviewed and revised the contents of their MSDSs. Modified

parts of the contents are various information as shown on the right figure.

MSDS Distribution and Customer Utilization

The distribution of MSDSs to customers has steadily increased. A total of 82 members distribute, on average, 12,000 MSDSs to customers (distribution rate: 92%). Surveys show that customers use MSDSs as an information source for evaluating product safety as well as for preparing manuals on the handling of substances. And also they are utilized as basic information for the product processed by the customer.

Communication with Customers

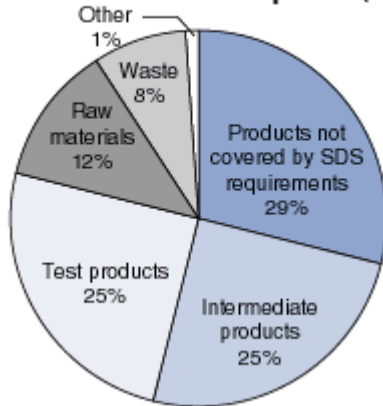
According to customers, communication from manufacturers is extremely important to ensure the safe use of chemical substances and enable appropriate responses to problems. In 1998, the MSDS utilization rate among customers rose slightly, to 89%.

Legal Requirements for MSDS Distribution

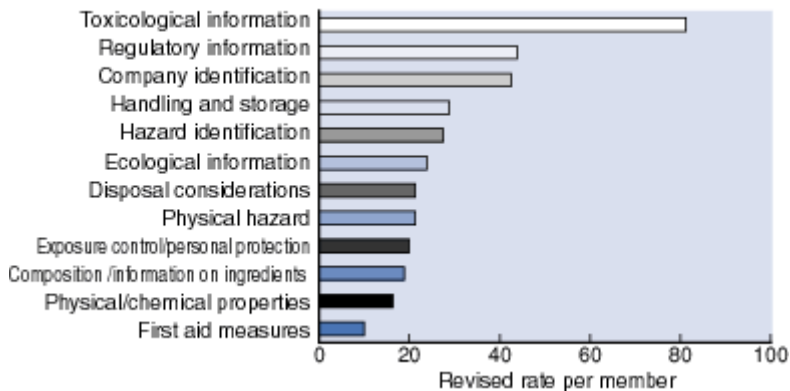
Regulations have been introduced requiring that MSDSs be should attached to extremely hazardous substances and distributed to people handling such substances. The obligations were effected through the revision of Article 57 of the Occupational Health and Safety Law in May 1999, and the Chemical Substances Emission Control Law in July 1999.

Of course, the JRCC members will comply with these legal changes and spread MSDS preparation of other substance which are not applicable to the laws.

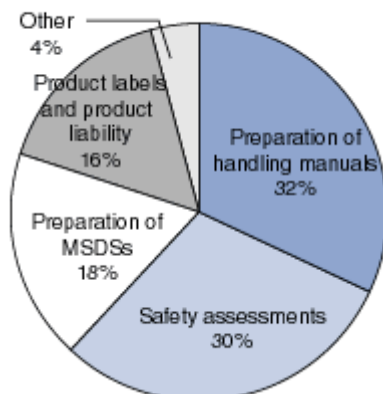
Chemical Substances for Which MSDSs Are Prepared (JRCC)



Contents of Revised MSDSs(JRCC)



Customer Utilization of MSDSs(JRCC)



Emergency Response Cards and Other Transportation Safety

What is an Emergency Response Card (Yellow Card)?

This is the name given to a card that contains information on appropriate measures to take should an accident occur during the transportation of chemical substances and high-pressure gases. This information is useful for truck drivers and other people who may be required to respond to an accident, such as people at accident sites, fire brigade personnel, and police.

Emergency Response Card Preparation

The average number of Emergency Response Cards published by members has risen to 347 (data from 85 companies).

The Emergency Response Card preparation rate has increased to 90% (data from 88 companies).

A total of 91% of members confirm that Emergency Response Cards are carried during transportation (data from 79 companies).

Members hand out Emergency Response Cards to truck drivers, educate them in their correct use, and confirm that the cards are carried during transportation.

Response Measures for Accidents during Transportation

A total of 99% of members maintain 24-hour emergency service contact systems (data from 82 members).

A total of 77% of members maintain joint accident response services (data from 81 members).

A total of 99% of members have set up 24-hour emergency service contact networks and prepared emergency manuals. Also, 77% of members maintain accident response services that are capable of dealing with various types of chemical substances.

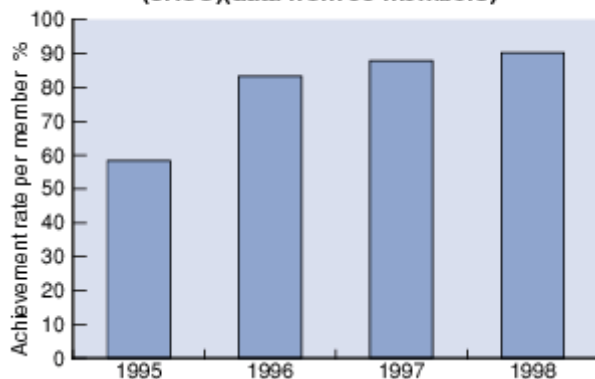
In particular, members have strengthened their cooperation with accident response centers maintained by the High-Pressure Gas Disaster Prevention Committee in the Tokyo metropolitan area and other regional areas to create a well-prepared joint accident response system.

Emergency Drills

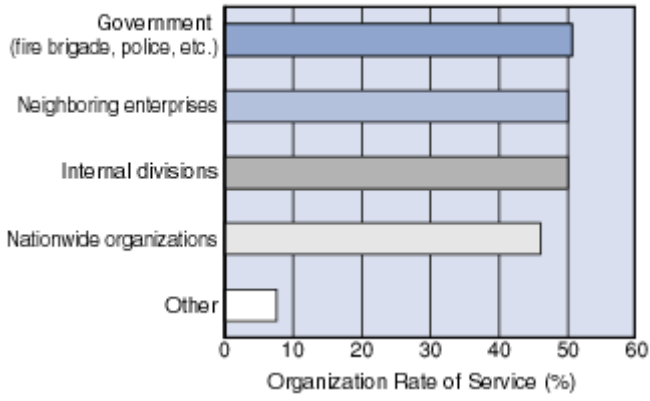
A total of 78% of members conduct emergency drills (data from 81 members).

A total of 78% of members conduct such drills as exercises for accidents during transportation as part of emergency preparation measures. Drills are divided approximately equally between internal company drills and those involving the cooperation of other companies or government organizations and include communication, location, and desk drills. Also, 90% of members have prepared emergency drill manuals.

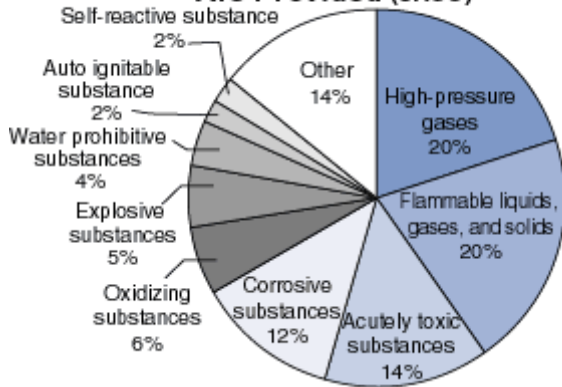
Status of Emergency Response Card Preparation
(JRCC)(data from 88 members)



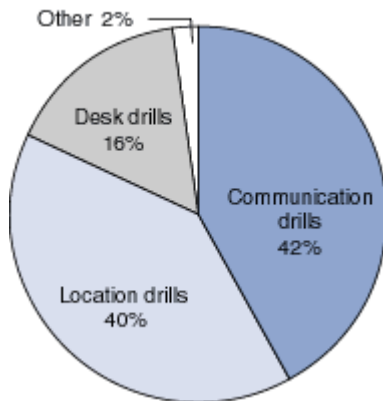
Joint Accident Response Services (JRCC)



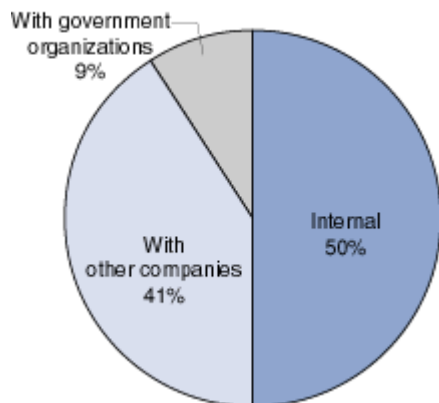
Substances for Which Response Services Are Provided (JRCC)



Emergency Drills (JRCC)



Scope of Emergency Drills (JRCC)



Responsible Care 1998 Annual Report

Recent Chemical Safety Topics

HPV program in ICCA Initiative

What is ICCA Initiatives?

The ICCA is cooperating with the OECD to accelerate the implementation of an HPV program undertaken to gather and analyze safety data on HPV (High Production Volume) chemicals. At the ICCA board meeting conference in Prague in October 1998, members agreed to prepare the Screening Information Data Sets (SIDS) and initial hazard assessments on 1,000 HPV chemicals by 2004.

JCIA Action

After announcing its participation in the HPV program at the Prague meeting, JCIA established the Committee for ICCA which consists of 26 member companies to tackle this issue. In addition, JCIA has set up JCIA Task Force Team for ICCA to promote activities.

ICCA Initiative Details

1. Drawing up of a working list specifying approximately 1,000 HPV chemicals
2. Commitment by participating companies
3. Input of the participating companies to tracking system
4. Formation of international consortia
5. Identification of the consortium Focal Point or the lead company
6. Identification of OECD sponsor country
7. Review and validation of the available data by the consortium
8. Identification of possible data gaps and agreement on testing
9. Agreement on burden and cost sharing
10. Consultation with the OECD Sponsor Country on testing plans
11. Implementation of the test
12. Evaluation of a data set
13. Report (draft) preparation
14. Submission of results to the OECD Sponsor Country

Current Progress

1. Drawing up a Chemical Working List

- Targeted chemical compounds : 1,184 chemicals as of April 22, 1999 (<http://www.icca-chem.org/hpv/infopac.htm>) Selection criteria : HPV chemicals manufactured in two or more regions, production of which exceeds 1,000t/y at least in one region (The list is open and may be expanded)

2. Request for Member Company Participation

- On April 12, the chairman of the JCIA requested members to participate in the HPV Program.
Registration Items :
 - 1)Registration Form
 - 2)Chemicals to be sponsored
 - 3)Chemicals to be co-sponsored
- Responses as of July 21, 1999 Number of participating companies : 45 Number of chemical substances nominated : 440 (including 41 chemicals sponsored as lead company)

3. Formation of Domestic Groups to implement the Initiative

chemical groups, they are interested in. Domestic groups (hereinafter referred to as panels) will be established to undertake the work of the Initiative efficiently.

<Domestic panels under consideration>

- Based on existing industrial associations: chloro-chemical, maleic anhydride, aromatic chemicals, surfactants, soap detergent, and plasticizers,
- Grouping Manufacturers : olefins and oxo-chemicals

Future Activities

The importance of the hazard assessment, the risk assessment and the risk management of chemical substances is increasing every day. Under such circumstances, it is essential for chemical industry to study the Hazard and Risk of its own products, establish the risk management process, and obtain the full understanding of the stakeholders on our Responsible Care activity. We will request member companies of the JCIA to increase their efforts in conducting this important task.

Recent Chemical Safety Topics

Long-Range Research Initiative (LRI)

What is LRI?

LRI is a long-term project undertaken by the ICCA to understand the effects of chemical substances on people's health and the environment. LRI was initially proposed a few years ago by the Chemical Manufacturers Association (CMA), of the United States, and adopted at the ICCA Board Meeting in October 1998. Work under the project is now in progress.

Objectives

The objectives of LRI are stated in 'Stake of The Science White Papers' prepared by the Chemical Industry Institute of Toxicology (CIIT), CMA, the European Chemical Industry Council (CEFIC), and the European Center for Ecotoxicology and Toxicology of Chemicals (ECETOC), which was released in January 1998. They are as follows:

- Extension of knowledge by conducting or supporting research
- Promotion of product stewardship by developing testing and screening tools
- Support of science-based public policy decisions

Both U.S. and European organizations seem to recognize that LRI project is based on the RC ethos of voluntary activity.

Details

Research themes will be selected from the nine broad areas that range from the mechanistic studies of hazardous effects such as chemical carcinogenesis and endocrine disruption, through risk assessment methodology (CMA has added a 10th field, epidemiological research). International cooperation will ensure that research is conducted in the most efficient manner.

Progress

In 1999, CEFIC allocated US\$5 million dollars for research in six priority areas, with specific research themes determined by specialists in each field. Researchers were invited to send in grant applications in May and June 1999, and work is scheduled to commence in autumn. CMA has decided to spend US\$67 million over the next three years on research in 10 areas and has already begun work on certain themes.

JCIA is now working with the organization and procedures to promote LRI and plans to begin work on the development of risk assessment systems and research on the endocrine disrupters.

Research Fields	(Themes)
1. Atmospheric chemistry	(6)
2. Chemical carcinogenesis	(7)
3. Ecosystem dynamics	(5)

4. Endocrine disruptio	(5)
5. Environmental and human exposure assessment	(18)
6. Immunotoxicity and allergy	(6)
7. Neurotoxicity	(7)
8. Respiratory toxicity	(6)
9. Risk assessment methodology	(8)

Cross-sectional Research Themes

1. Sensitive subpopulations
2. Exposure assessment
3. Biomarkers
4. Interspecies extrapolation issues
5. Mixtures
6. Reproductive and developmental issues

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Dialogue with the Community

JRCC Begins Its Second Series of Regional RC Meetings

The JRCC has begun a second series of regional RC meetings at petrochemical complexes in Chiba, Yokkaichi, and Kawasaki, three of Japan's nine major petrochemical complexes. At the first series of meetings, JRCC member companies explained RC activities on environmental preservation, disaster prevention, occupational safety, and product stewardship conducted by members at plants to governmental officials as well as representatives from member's labor unions, regional nonmember chemical enterprises, and other associations and industries. At the second series of meetings, participation has been expanded additionally to local resident representatives and school teachers. In addition, presentation has been improved such that collective data from local member plants in a region has been firstly presented in a report for its region.

Surveys taken after the meetings showed that recognition of RC activities among first participants was higher than in the first series of meetings in each region.

Listed below are the main opinions expressed by participants.

- Local residents: Dialog between residents and company representatives are very important.
- School representatives: Hope that such plastics that a teacher can teach students are produced, for example plastics that can be easily decomposed, mild to native and bring people generous.
- Government officials: Hope that performance should be improved continually by setting targets.

Dialogue with Consumer Organizations

In addition to its Regional RC Meetings at petrochemical complexes, JRCC held a panel discussion forum in November 1998, inviting representatives from consumer organizations, the government, as well as academic and corporate communities. Approximately 280 people attended the debate, including government officials, school teachers, and students. Also, in April 1999 the JRCC sponsored a workshop for consumer organizations at which company and consumer representatives engaged in open discussions on various issues. Approximately 30 people attended.

Future Schedule

The JRCC will continue its series of Regional RC meetings at major petrochemical complexes and plans to hold meetings in areas outside these regions. In addition, new opportunities for discussions will be promoted.



Regional RC Meeting in Yokkaichi



Dialogue Meeting

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Company RC Reports

The number of members releasing RC reports to the public is steadily increasing. In 1998, 41 members published RC reports, some of which are displayed here. In addition, 27 companies posted RC reports on their home pages. Links to these home pages can be found at the [JRCC home page](http://www.nikkakyo.org/jrcc/eindex.htm) (<http://www.nikkakyo.org/jrcc/eindex.htm>).

Recently, the content of the RC reports has been enriched, for example, introduction of actual activities, and reporting performance figures by using graphs and charts. In particular, there has been a conspicuous rise in the number of companies showing absolute-value data. This trend reflects a growing consciousness among companies about the need for greater transparency.

To improve the quality of communication with regional communities, JSR Co., Ltd., has published an RC report for its Yokkaichi Plant in addition to its company RC report.





Change of Home Page Address

JRCC established its home page in October 1998. Now, its address changed to <http://www.nikkakyo.org/>.

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Global Expansion of RC Activities

45 Countries under the Umbrella of the RCLG

The 45 member nations and regions of the International Council of Chemical Associations (ICCA) promote independent RC activities in the framework of the RC organizational structure.

Asia Pacific Region	Japan, Hong Kong, India, Malaysia, Philippines, Singapore, Taiwan, Australia, New Zealand, Thailand, and Indonesia
American Region	Canada, Mexico, United States, Argentina, Brazil, Chile, Colombia, Peru, Uruguay, and Ecuador
European Region	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Great Britain, Czech Republic, Hungary, Poland, Slovakia, Turkey, South Africa, Zimbabwe, and Morocco

RCLG Meeting

The 1999 RC Leadership Group (RCLG) Annual Meeting was held in Sao Paulo, Brazil, from August 24 through 26. This year's conference was attended by 38 members representing 24 countries and regions.



Peer Review

For the first time, on a trial basis, this year's meeting featured a Peer Review, in which individual countries reported on their RC activities. Presentations were followed by open discussions by all countries. This segment focused on the South American region, specifically Brazil, Argentina, and Mexico, and discussions were based on the reports given by these countries.



Experience Exchange

Also on a trial basis, USA, UK, Canada, Australia and Japan cited examples of particularly successful RC activities conducted during the year. Japan introduced examples of such communication activities as the regional meetings and dialog meetings.

New Members

Indonesia, Uruguay, and Ecuador were accepted as members of the RCLG, increasing the number of member nations and regions to 45.

Participation of Labor Union Representatives in RC

At the February 1999 ILO Conference, representatives from international labor unions expressed their interest in participating in RC activities. The response to the idea was discussed.

Subgroup Activities

Activities and objectives of the following four subgroups—created in 1998 within the RCLG organizational structure—were reported on and discussed.

- 1) Implementation Sub-group
- 2) Performance Indicators Sub-group
- 3) Communication Sub-group
- 4) Membership Sub-group

Other

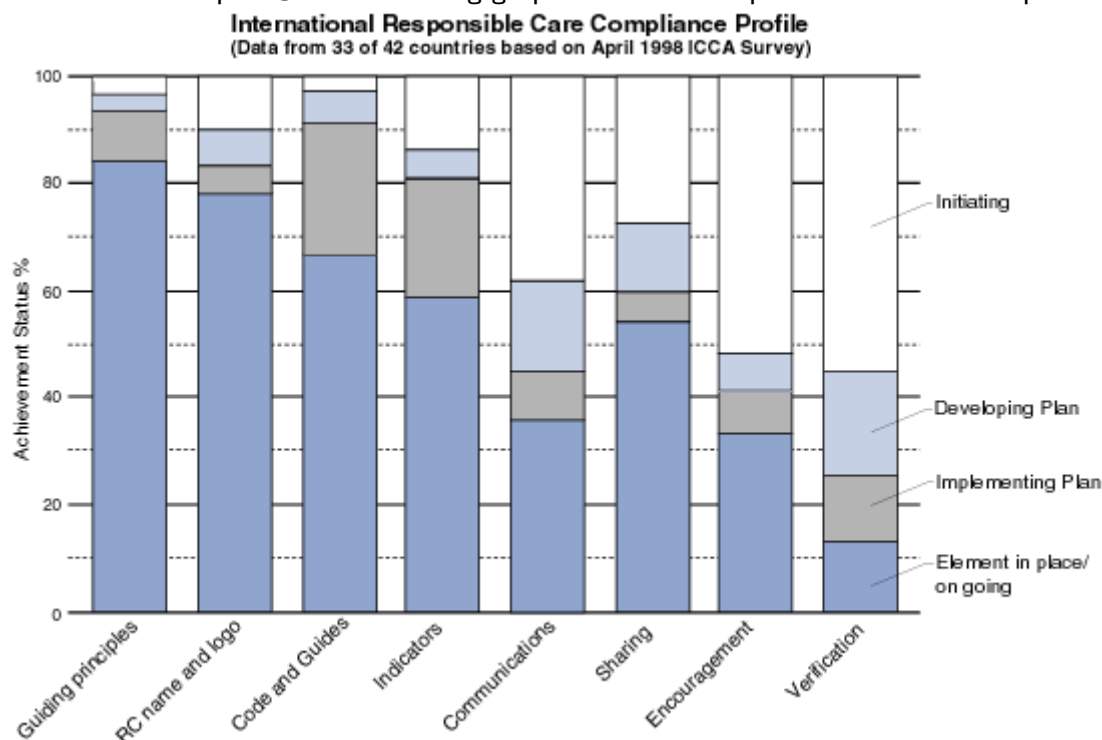
It was decided that the next RCLG meeting would be held in Lisbon, Portugal.

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Overseas RC Activities

RC International Implementation

As of August 31, 1999, 45 countries are involved in RC implementation initiative. Every two years, ICCA conducts surveys on the status of each country's RC implementation for defined fundamental feature and milestone and the result is published as 'Responsible Care Status Report'. The following graph shows the implementation status percentages.



Status of Third-Party RC Verification of Member Countries

- Canada : As the founding county of RC, Canada has been aggressive in its verification efforts; Has completed system verification of each member company and has begun a second round of verifications, including performance verifications.
- United States : Carrying out system verification procedures through companies in the same industry and regional experts; Aims to have completed verification of all members by 2001
- United Kingdom : Prepared new guidelines for RC management system; Plans to initiate self-assessment and third-party evaluations according to new guidelines; Self-assessment to become mandatory from 2000; Decision to undergo third-party evaluations will remain at the discretion of individual companies
- Europe : European Chemical Industry Council (CEFIC) has issued self-assessment manual and report guidelines. However, verification is at the discretion of individual countries. Germany plans to only verify performance results announced at its association.
- Japan : Continuing study of verifications within the framework of the JRCC

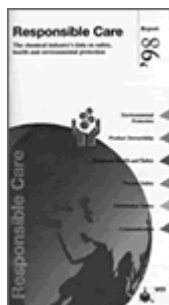
Although the progress of each country's RC activities is similar, the main focus until now has been on the establishment of RC activities in each country. At present, third-party verification is only carried out by a portion of member countries. This is an international issue.

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RC Annual Reports Published by Various National Associations



ICCA



Germany



Sweden



Canada



Finland

CAREline News

Japanese Information to CAREline Newsletter

One of RC's key global activities is the publication of CAREline News, a quarterly magazine that features stories on RC initiatives worldwide. As of the past April 1998 edition, CAREline Executive Summary was available in Japanese.

In the future, CAREline News will continue to report enthusiastically on RC activities taking place in Japan for audiences around the world. Japanese Information to CAREline Newsletter

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In the future, CAREline News will continue to report enthusiastically on RC activities taking place in Japan for audiences around the world.



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RC Implementation Target Items

The following table shows the trend of the members' main RC target areas. The table summarizes items.

Target Items	1995 Plan & Implementation	1996 Plan & Implementation	1997 Plan & Implementation	1998 Plan & Implementation	1999 Plan
Performance	Reduce environmental burden – energy and resources saving – reduce industrial waste	ditto	ditto	ditto – Recycling	ditto
Product Stewardship	Preparation of MSDSs & Emergency Response Cards	ditto	ditto emphasize product stewardship	ditto – Conduct hazard/risk assessment	ditto – Promote development of products with low environmental impact – Participate in the ICCA's HPV Program
PRTR	55 chemicals	152 chemicals	286 chemicals	284 chemicals	Approximately 300 chemicals
ISO Certification	Introduce ISO 9000	Introduce ISO 9000 & 14000	ditto	ditto	ditto
Chemical Safety at R&D			Hazard/risk assessment	ditto	ditto
Improving Public Trust				– RC Annual Report – Foster regional dialogue – Environmental safety in international operations	ditto – RC annual reports and policies on Internet home pages – Study of environmental accounting systems – Green purchase – Volunteer activities

The target items that members continue to emphasize include reducing the emission level in the environment through efforts of conserving energy and natural resources and reducing industrial wastes. In the years to come, greater attention will be given to more challenging issues such as waste recycling, conversion to new fuel sources, and implementation of global-warming countermeasures. Members are making efforts to strengthen the product stewardship, which is centered on provision of MSDSs and Emergency Response Cards. In addition, they are in development of products that have less impact on the environment. The JRCC members have been reporting voluntarily chemical emission level ahead of the PRTR legislation and many members have been accredited to or are making preparations for ISO 14001 certification for their environmental management systems.

The most visible RC achievements are made in the area of public trust through RC reports publication and holding dialogues with regional communities. The ultimate purpose of such activities is to secure the communities' trust in the safety of members' operations. Internet home pages are growing in popularity as a media for disclosure of RC information. Members are also increasing efforts to strengthen their environmental and safety performance in their overseas operations.

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RC Activities Example of JRCC Members

Outlined below are some of the member activities that appeared since the 1998 autumn edition of Japan Responsible Care News, a seasonal publication.

Konica Corporation (Tokyo Factory)



- "Sakura-machi" activity
- Raised awareness of environmental issues by commendation and education
- Implemented of an environmental management system
- Released internal environmental audit guidelines

Hitachi Chemical Co., Ltd. (Shimodate Factory)



- Obtained ISO 14001 certification
 - Became the first of six in domestic office, research center and factories to obtain ISO certification
- Communicated with regional community
 - Organized fireworks displays cooperating with neighborhood self-governing bodies.
 - Requested local school children for drawing the original pictures painting on factory walls

Nippon Kayaku Co., Ltd. (Tokyo Factory)



- Implemented measures appropriate as a metropolitan factory
- Interacted with regional communities
 - Organized an autumn festival and mochi (a Japanese sweet) making festival
 - Obtained ISO 14001 certification
 - Hosted factory tours for local school children

Nippon Paint Co., Ltd. (Tochigi Factory)

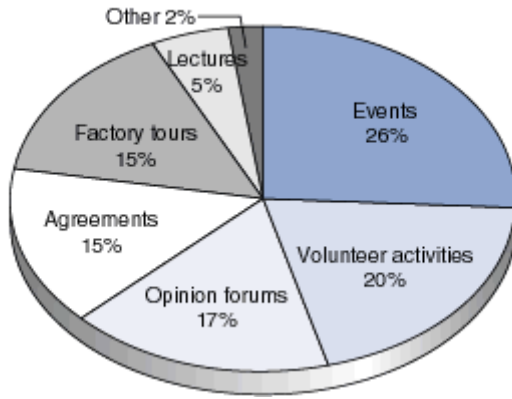


- Supported beautification activities around the factory grounds
- Communicated with regional community
 - Gave lectures at a regional university
 - Hosted factory tours
- Obtained ISO 14001 certification

Regional Community Interactions

The graph of the right shows various events held by members to improve communication with regional citizens.

Example of Regional Community Interaction



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RC Management Systems

Every year, the member companies submit their RC activity reports on the previous year and plans for the upcoming year to JRCC. At the same time, the member companies provide their self-assessment of their RC management systems based on their internal audits. In the past four years since the establishment of JRCC, the members have continuously made progress in management system establishment. The new members have also acted quickly to establish the RC management systems.

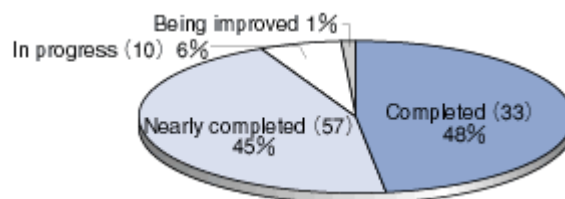
Self-Assessment Scores (% for 87 members)

Scale : 5 points = satisfied 4 points = mostly satisfied 3 points = in progress 2 points or 1 point = needs improvement

* 1997 figures in parentheses

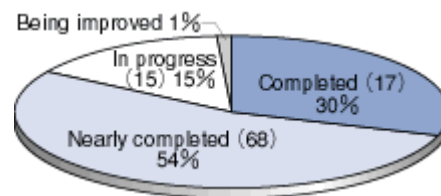
1. Management systems and targets

All member companies include RC in their management systems and set ambitious RC targets annually. 93% of the members have achieved or nearly achieved these targets, while 7% are still progressing toward their targets.



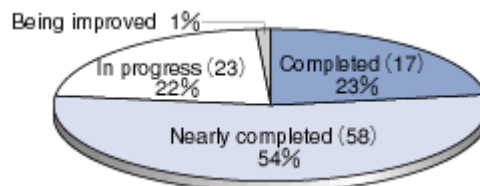
2. Implementation systems

84% of the member companies have executive officers designated responsible for RC and internal management systems and at the same time they actively introduce ISO certification into their internal systems.



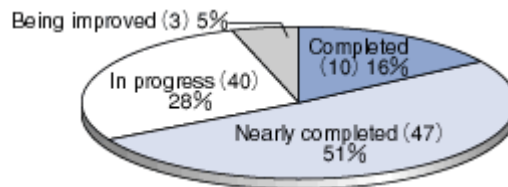
3. Internal self-auditing systems

All members are required to establish an internal self-auditing system and verify the implementation and management status of RC plans. 77% of the members satisfactorily met these objectives, and 23% are in the process of establishing internal audit systems.



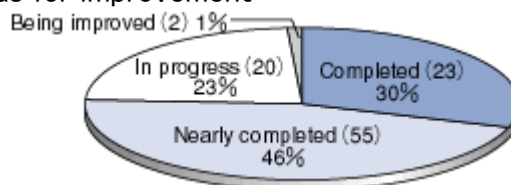
4. Education systems

The establishment of in-house education systems for employees and other related parties is a very important part of RC program. 68% of the members have established such systems while the remaining 32% acknowledge the needs for improvement.



5. Implementation plans and annual reports

Approximately 75% of the members evaluate their RC implementation reports and plans satisfactory, while the remaining 25% recognize the needs for improvement



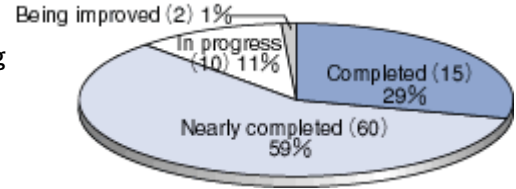
6. Environmental and safety management on production, handling, distribution, use and final consumption, and disposal

– Production and handling: Approximately 85% of members are satisfied with their production and handling management.

– Transportation: Approximately 83% of members are satisfied with their distribution management.

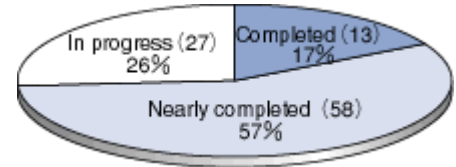
– Use and final consumption: Approximately 85% of members are reportedly satisfied with their use and final consumption management.

– Disposal: Approximately 84% of members are satisfied with their disposal management, while the remaining 16% are working to improve their systems.



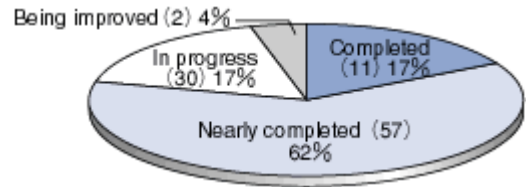
7. Environmental and safety management regarding R&D and new businesses

74% of the members are satisfied with the level of management, while 26% are implementing measures to improve R&D management.



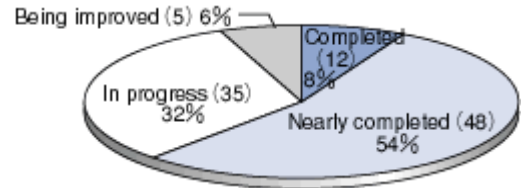
8. Environmental and safety management regarding international operations

Approximately 78% of members are satisfied with their level of management.



9. Winning the public trust

While 62% of members are satisfied with their ability to win the trust of the community, the remaining 38% acknowledge a need to improve their performance.



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Surveys of RC Activities

1. Investment

The majority of investment in environmental conservation (49%) was focused on water, air, and noise pollution measures; followed by reduction of wastes, recycling promotion, energy conservation, and reduction of CO₂ and other harmful emissions; and measures to promote greening of the environment. The investment area is shifting from pollution prevention to environmental conservation and improvement. In the area of process safety and accident prevention, the investments are made to improve facilities and labor safety, to enhance working environments, and to prevent explosions, fires, and leaks as well as to prepare appropriate action in the event of earthquakes.

2. Chemical Substances Risk Assessment

99% of the members have Risk assessment systems in the areas of storage, transportation, use by customer. The assessment is conducted in response to new development, new legislation, accidents, and to the results of voluntary research.

3. Risk Assessment of Plant Facilities

95% of the members have assessment systems on facilities in operation at manufacturing plants as well as storage and transportation. Members review safety to prevent accidents and as explosions, fires, and leaks, and the assessments are conducted at the time of facilities improvement of existing facilities, legislation changed, data on previous accidents, and surveys and research.

4. MSDS

All members prepare MSDS and make necessary amendments to the legislation. The majority of members also prepare MSDSs for other products than those listed as well as trial and intermediary products. MSDSs are a vital source of information provided to customers from chemical companies in hazard evaluation and for their preparation of procedures. With the introduction of PRTR systems, the MSDS format shall be standardized.

5. Emergency Response Card

90% of the members prepare emergency networks for 24-hour response systems in the event of accidents. Members are also strengthening cooperation among their transportation companies to extend support in case of accident or other trouble on transportation. In addition, 80% of the members have mutual support agreements among the neighboring companies, industry associations, and authorities for accidents involving high-pressure gas, flammable and poisonous and corrosive materials.

6. Community Relationship

50% of the members publish RC reports or even disclose RC information on their Internet home pages. Members are steadily improving the quality of information on their RC policies and safety management systems as well as their performances on wastes and air and water pollutants emission, energy conservation, and occupational health and safety. In addition, the members are building their relationships with regional communities through various events such as open-house and volunteer activities. Agreements on environmental and safety, chemical usage, and operation management are exchanged as well as information for the exchange meetings are held to build the communities' trust in the safety of the members' activities.

7. ISO Certification

84% of the members have been accredited to ISO 9001 and 9002 (product quality management) certification and approximately 50% have already been or are currently preparing to be accredited to ISO 14001 (environmental management) certification.



Responsible Care 1998 Annual Report

Surveys of RC Activities

As of August 31, 1999 there were 106 JRCC members.

Regional RC Meetings and Dialog Meetings

In 1998, JRCC held a second series of Regional RC meetings at Chiba, Yokkaichi, and Kawasaki, where are three of Japan's nine major petrochemical complexes. In addition, dialog meetings were held with consumers to expand the scope of communication of RC activities, which is a first step of mutual understanding.

RC Report Meeting and Panel Discussion

JRCC held the meeting on 1998 Annual Report in Tokyo and Osaka. In the panel discussions, issues of risk management and PRTR system were discussed.

Fifth JRCC Advisory Board Meeting

The following issues were arisen :

1. "Fairness" and "Justice" are key words in verification
2. Women should join RC activities .
3. To be either "safe" or "unsafe" is not productive or dialog.
4. It is important to share common value at a dialog.

Main Activities of JRCC

Major RC Events	Japan	International
1998 / May	JRCC General Meeting	RCAP'98 in Taipei
July	Memorial members' exchange meeting on joining 100 companies	
September		RCLG Meeting in Australia
October	Establishment of JRCC home page 1997 Annual Report Meeting in Tokyo	ICCA Board Meeting in Prague
November	1st dialogue meeting with consumers Digest version of JRCC '97 Annual Report published	
December	1997 Annual Report Meeting in Osaka	
1999 / January	2nd Chiba Regional RC Meeting	
February	5th JRCC Advisory Board meeting	ILO'99 Meeting in Geneva
March	Members' exchange meeting	
April	2nd dialogue meeting with consumers	
May	JRCC General Meeting	
June	2nd Yokkaichi and Kawasaki Regional RC Meetings	

Nos. 9 through 12 of JRCC News issued by JRCC.



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JRCC Members List

Total: 108 companies (in alphabetical order, 31 October 1999)

AgLead K.K.
Air Products Japan, Inc.
Akzo Kashima Limited
Asahi Chemical Industry Co., Ltd.
Asahi Denka Kogyo K.K.
Asahi Glass Co., Ltd.
BASF Japan Ltd.
Bayer Ltd.
Central Glass Co., Ltd.
Chisso Corporation
Ciba Specialty Chemicals K.K.
Clariant (Japan) K.K.
Daicel Chemical Industries, Ltd.
Dai-ichi Kogyo Seiyaku Co., Ltd.
Daikin Industries, Ltd.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.
Dainippon Ink & Chemicals, Incorporated
Dai Nippon Toryo Co., Ltd.
Daiso Co., Ltd.
Denki Kagaku Kogyo Kabushiki Kaisha
Dow Chemical Japan Limited
Dow Corning Toray Silicone Co., Ltd.
DuPont Kabushiki Kaisha
DuPont-Mitsui Fluorochemicals Company Limited
DuPont-Mitsui Polychemicals Co., Ltd.
Fuji Photo Film Co., Ltd.
Hitachi Chemical Co., Ltd.
Hodogaya Ashland Co., Ltd.
Hodogaya Chemical Co., Ltd.
Hokko Chemical Industry Co., Ltd.
ICI Japan Limited
Idemitsu Petrochemical Co.,Ltd.
The Inctec Inc.
Ishihara Sangyo Kaisha Co., Ltd.
Japan Acrylic Chemical Co., Ltd.
Japan Elastomer Co., Ltd.
JSR Corporation
Kaneka Corporation
Kansai Paint Co., Ltd.
Kanto Denka Kogyo Co., Ltd.
Kao Corporation
Koei Chemical Company, Limited
Konica Chemical Corporation
Konica Corporation
Kuraray Co., Ltd.
Kureha Chemical Industry Co., Ltd.
Kyowa Hakko Kogyo Co., Ltd.
Lion Corporation
Maruzen Petrochemical Co., Ltd.
Mitsubishi Chemical Corporation
Mitsubishi Gas Chemical Company, Inc.
Mitsubishi Rayon Co., Ltd.
Mitsui Chemical Inc.
Mizusawa Industrial Chemicals, Ltd.

Nankai Chemical Industry Co., Ltd.
Nihon Nohyaku Co., Ltd.
Nippon Bee Chemical Co., Ltd.
Nippon Chemical Industrial Co., Ltd.
Nippon Kayaku Co., Ltd.
Nippon Paint Co., Ltd.
Nippon Petrochemicals Company Limited.
Nippon Polyurethane Industry Co., Ltd.
Nippon Shokubai Co., Ltd.
Nippon Soda Co., Ltd.
Nippon Steel Chemical Co., Ltd.
The Nippon Synthetic Chemical Industry Co., Ltd.
Nippon Unicar Company Limited.
Nippon Zeon Co., Ltd.
Nissan Chemical Industries, Ltd.
NOF Corporation
Novartis Japan K.K.
Oronite Japan Limited
Osaka Petrochemical Industries Ltd.
Polyplastics Co., Ltd.
Rohm and Haas Japan K.K.
Sanko Co., Ltd.
San Nopco Limited
Sanyo Chemical Industries, Ltd.
Sekisui Chemical Co., Ltd.
Sekisui Plastics Co., Ltd.
Shell Japan Ltd.
Shikoku Chemicals Corp.
Shin-Etsu Chemical Co., Ltd.
Showa DDE Manufacturing K.K.
Showa Denko K.K.
Showa Highpolymer Co., Ltd.
Showa Tansan Co., Ltd.
Sika Japan Ltd.
Solutia Japan Limited
Sumitomo Bakelite Co., Ltd.
Sumitomo Bayer Urethane Co., Ltd.
Sumitomo Chemicals Co., Ltd.
Sumitomo Seika Chemicals Co., Ltd.
Takeda Chemical Industries, Ltd.
Taoka Chemical Company Limited
Tayca Corporation
Techno Polymer Co., Ltd.
Teijin Limited
Toagosei Co., Ltd.
Tokuyama Corporation
Tonen Chemical Corp.
Toray Industries, Inc.
Tosoh Corporation
Toyo Ink Mfg. Co., Ltd.
Tsurumi Soda Co., Ltd.
Ube Cycon, Ltd.
Ube Industries, Ltd.
Union Carbide Japan K.K.