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The Chemical Industry's Initiative to Protect the Environment and Promote Safety and Health

Responsible Care Report 2003

The Japan Responsible Care Council

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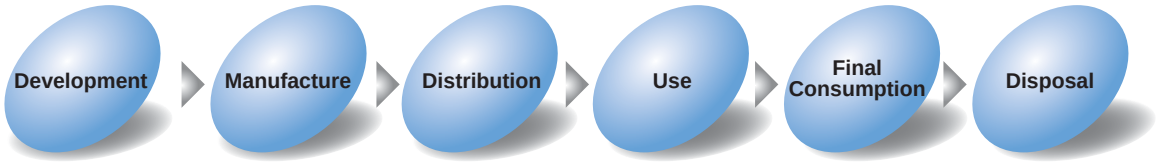
Do You Know Responsible Care?

What Is Responsible Care?

Chemical substances are now an indispensable part of our livelihood. However, when improperly handled, they are also latently hazardous substances that threaten human health and the environment.
Although concerns over the health, safety and environment have become widespread as a result of the expansion of global environmental problems and the growth of industrialized regions, technological developments continue to face new dilemmas. Given these circumstances, chemical substances regulations have become limited in their capacity to fully preserve the health, safety and environment. Presently the public call for handlers of chemical products to take responsible and voluntary action to protect the health, safety and environment is greater than ever.
In response, the global chemical industry, comprising a multitude of corporations that handle chemical substances the world over, is working voluntarily to preserve the health, safety and environment in every process, from the development of chemical substances through their manufacture, distribution, use, final consumption and disposal as well as conducting dialogue and discussion with the public by openly disclosing the results of these efforts. These efforts are known collectively as Responsible Care.



Responsible Care was initiated in Canada in 1985. The year 1990 marked the establishment of the International Council of Chemical Associations (ICCA). The 47 countries around the world initiate Responsible Care (as of October 2003). In 1995, the Japan Responsible Care Council (JRCC) was established within the Japan Chemical Industry Association (JCIA) by 74 corporations, primarily manufacturers and handlers of chemical substances. With the JRCC's establishment, corporate efforts to address environmental and safety concerns were united and intensified, and the goal of enhancing public understanding was undertaken. As of October 2003, the JRCC comprised 114 corporate members.

The Responsible Care Logo

The logo, depicting a pair of hands and a model of a molecule, expresses the key message of handling chemical substances with care and the ICCA has adopted the logo as the common insignia of international corporations and associations that implement Responsible Care. Permission to use the logo has been granted to the chemical industry associations of all ICCA member countries as well as the respective members of those associations.
In Japan, the Responsible Care logo can be used by the JCIA, the JRCC, and JRCC member companies.

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Responsible Care Implementation Items

The JRCC and its member companies collectively take action in five principal areas:
- Environmental preservation (protecting the global nature and the health)
- Process safety and disaster prevention (striving to prevent disasters at industrial facilities)
- Occupational safety and health (protecting the safety and health of workers)
- Product stewardship (clearly identifying the properties and handling methods of chemical products and protecting the health, safety and environment of all persons who handle these products, including customers)
- Distribution safety (preventing accidents during transportation of chemicals and protecting the human health, safety and environment).

The JRCC and its members also maintain
- Dialogue with the community

by publicly reporting the results of these efforts.
These efforts are spearheaded primarily by the Planning and Management Committee. Under the committee, there are the Steering Committee and six working groups, which are responsible for annual reports, dialogue, international affairs, verification, PRTR (Pollutant Release and Transfer Register) response, and member experience exchanges.

★ Refer to the JRCC's web site, http//www.nikkakyo.org/organizations/jrcc/index.html

Message from JRCC Chairman

Hiroyuki Nakanishi
Chairman
Japan Responsible Care Council

The 21st Century, I conceive, is the era which makes it extremely important to sustainably develop living bases and economic activities under the harmonious coexistence of mankind and global environment.
While the chemical industry has provided technology and products, has built up affluence, and has contributed to society as an industry to realize dreams, some chemical products have potential risks of giving harmful influence on health and environment, if they are handled improperly. It may be said that the mission of the chemical industry is to maximize the usefulness of chemical substances while attempting to minimize such risks.
Chemical enterprises have been promoting technology development and strengthening competitiveness, trying to survive under the circumstances of borderless market economy accompanied by the progress of globalization. In order to support " the development of sustainable society, " initiatives for Responsible Care may be indispensable, taking " harmony with the environment " and " cooperate social responsibility " in sight.

The Japan Responsible Care Council has entered 9th year after its establishment in April 1995. Looking back our activities up to date, steady progress has been recognized toward the initial target.

Followings are a brief outline of our current activities:

1. In the environmental preservation area, member companies have continued their efforts to enhance initiatives and have marked further remarkable progress in reducing hazardous air pollutants and industrial wastes, of which achievement would surpass the chemical industry's goals.
2. As regards communication with the community, the JRCC has strived to replete dialogues by widening objective persons and increasing opportunities. In addition, coupled with the enforcement of PRTR law, member companies have apparently been holding communications having transparency such as announcement of PRTR data in Responsible Care reports, having opinion exchange meetings with communities, etc. I believe further repletion of them will be important hereafter.
3. JRCC verification system, which aims to enhance effectiveness, objectivity and transparency of member companies' Responsible Care activities, officially started last year. This year we have added to it the verification of Responsible Care reports. Positive application of the system and further enhancement thereby of the effectiveness of the activities are expected.
4. From the point of view of international activities, the JRCC has taken the initiative as a promoter of Responsible Care in the Asian region such as positive participation in the International Council of Chemical Associations (ICCA), the Responsible Care Leadership Group (RCLG), and the Asia Pacific Responsible Care (APRC) as well as their supporting activities, etc.

Global and remarkable change has been seen in recent circumstances on Responsible Care. Making necessary review to the JRCC action plan from the medium term viewpoint, we will take the initiative for further enlargement of Responsible Care in the future.
I sincerely hope that the JRCC Responsible Care Report 2003 will deepen your understanding about the JRCC's Responsible Care initiatives. I wish to take this opportunity to ask for your further support of the JRCC.

November 2003

H. Nakanishi

Board Members of Japan Responsible Care Council

Chairman	**Hiroyuki Nakanishi**	Chairman, Japan Chemical Industry Association, President, Mitsui Chemicals, Inc.
Vice Chairman	**Tadasu Tachi**	Counselor, Kaneka Corporation
Vice Chairman	**Minoru Ohnishi**	Chairman, Fuji Photo Film Co., Ltd.
Auditor	**Takanori Yoneyama**	Honorable Advisor, Konica Minolta Holdings, Inc.
Auditor	**Akira Ohira**	Chairman, Mitsubishi Gas Chemical Company, Inc.
Director General	**Masami Tanaka**	Director General, Japan Chemical Industry Association

Message from JRCC Advisory Board Chairman

Hiroyuki Yoshikawa
Chairman
Japan Responsible Care Council Advisory Board

At the present age so-called technologies era, many studies are made at universities and laboratories, and new knowledge is produced incessantly. They are effective for enhancing abundance and safety for our living. The enhancement, however, is not directly brought by the knowledge created by the studies. There indispensably needs a process to create the value in the society using the knowledge.

Industry is the leading part to create the value. In other words, the producer of wealth at the present age is the industry. And, in it, the chemical industry occupies a large portion.

Now, it is said that the industry has been meeting " Industrial Transformation" equivalent to the Industrial Revolution 200 years ago. This indicates the status that the industry to perform an important role to solve the difficult question of today of the sustainable development has to contrive the new systems different from conventional ones all in the technologies which the industry has made its basis as well as product design, production, distribution, marketing, etc. In the chemical industry this means minimizing the load of chemical substances against the ecosystem including human being and the environment is sought for.

It is desirable that new systems for the production of substances answering such purpose, and effective methods for risk management have been rapidly developed. On top of it, the Japan Responsible Care Council has been striving to make these developments effective in reality. That is " Chemical industry's voluntary managing activities to protect the environment, safety and human health," without which we must say " Industrial Transformation" in the realistic chemical industry cannot be attained. In conventional industry, each company could only put its products on the market and ask if they are sold well or not. However, Industrial Transformation aims to grasp what effects the whole products respective companies put on the market give to the environment, and after that to maximize good effects while minimizing bad effects.

There exists the viewpoint of the effect as a whole industry. And after determining the effect, next countermeasures are decided. In order to pursue this method, the whole industry is too big and it is required for each industrial sector to make its peculiar efforts.

Responsible Care conducted depending on characteristics peculiar to the chemical industry covers disaster prevention, occupational safety, and distribution safety, not to mention environmental preservation technology. And, it also promotes the dialogue between the industry and the general society. These are important elements when speaking of Industrial Transformation during the sustainable development. When not only each individual company but also the chemical industry as a whole takes the initiative of these elements, the Industrial Transformation will be realized. This JRCC report describes the results of the realistic efforts, which makes this report valuable.

Members of Japan Responsible Care Council Advisory Board

Hiroyuki Yoshikawa	President, National Institute of Advanced Industrial Science and Technology	**Hiroyuki Torii**	Professor, Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology
Kazuo Akita	Professor Emeritus, University of Tokyo	**Motoo Nakahigashi**	PAdviser, UBE INDUSTRIES, LTD.
Yoichi Uehara	Professor Emeritus, Yokohama National University	**Keiko Nakamura**	Director General, JT Biohistory Research Hall
Katsutoshi Kato	President, Japanese Federation of Energy and Chemistry Workers Union	**Nagaharu Hayabusa**	President, The journalist workshop for global citizens
Masaomi Kondo	Director General, Chemicals Evaluation and Research Institute, Japan	**Miyoko Hyodo**	Vice President, Japan Housewives' Association
Haruhiko Sakurai	Executive Director, Japan Industrial Safety and Health Association; Head of Occupational Health Research and Development Center	**Akio Yamamoto**	Professor Emeritus, Tokyo Institute of Technology

JRCC Activity Plan and Its Implementation Status

It has passed nine years since the JRCC was established in April 1995. Generally speaking, it has conceivably achieved such results as originally planned at the time of its establishment. When it comes to analysis in terms of the environment, safety and human health, however, it must be recognized that there exists certain severe evaluation about the chemical industry and chemical substances. In addition, the recognition concerning Responsible Care being still at low level, further disclosure of information and more communication are sought for.

The JRCC has been conducting its activities in line with the policy below set in its middle term plan (2001-2005). The following table shows the activity plan for the fiscal year of 2002 and its implementation status, and also its plan for the fiscal year of 2003:

Responsible Care Policy

①Increase the transparency of Responsible Care activities and encourage information disclosure and communication with the public

② Promote adoption of Responsible Care

③ Play a leadership role in Asian nations

④ Improve its performances continuously

	Plan for Fiscal 2002	Implementation Status in Fiscal 2002	Plan for Fiscal 2003
Information Disclosure	• Draft and publish reports	• Drafted reports • Held an annual report meeting in Tokyo and in Osaka • 62 members in total including 4 newly issued members issued environmental reports	• Draft and publish reports • Promote and support members to issue environmental reports
Communication	• Prepare a guidebook for dialogue with local communities • Implement dialogue with local communities and consumers organizations including new ones	• Held dialogue-forums at 8 locations including existing and new locations. Conversion to dialogue forums progressed to some degree. • Held dialogue forums with student organizations and consumer organizations 5 times in total	• Continue and enrich existing dialogue forums (communities, citizens) • Expand targets of dialogues • Strengthen foundations of dialogues
Promote Responsible Care activities	• Expand membership by 10% • Support affiliates' activities	• Joined 6 new members	• Expand membership by 10 companies • Support promoting Responsible Care activities by members' affiliates'
International Activities	• Support Asian countries • Support Responsible Care activities of Japanese companies operating in Asia	• Implemented support for Philippines and Thailand • Requested Japanese companies operating in Asia to join RC organization existing there	• Support Asian countries • Positively participate in the ICCA/RCLG activities • Participate in APRC conference in Korea
Chemical & product safety	• Dialogue with the chemicals user industries	• Conducted dialogue with the electrical machinery and automobile industries through holding study seminars on green procurement	•Implement providing appropriate information and communication
Support Responsible Care activities of members	• Hold experience exchange meetings in line with the needs of members	• Staged two exchange meetings and one workshop meeting for members on risk communication, etc.	• Hold experience exchange meetings and workshops meetings for members
Measures responsive to PRTR system	• Revise the guidebook • Conduct seminars	• Started to study support responding to risk communication	• Support raising capable persons for promoting understanding of the society
Responsible Care verification	• Conduct full scale verification at more than 10 companies	• Implemented verification of 5 companies	• More than 15 companies to undertake the verificationa

Summary of the Responsible Care Report 2003

This is the JRCC's eighth annual report.

Features of the Responsible Care Report 2003

- This report is an overview and summary of the JRCC's activities as a whole, while focusing primarily on the individual activities of 114 JRCC members.
- The quantitative presentation of Responsible Care activities has been compiled on the basis of performance data supplied by JRCC member companies, while the qualitative presentation of Responsible Care activities has been compiled based on written reports of fiscal 2002 JRCC activities, including surveys carried out among JRCC member companies.

Summary

● Environmental Preservation ●

★ Surveys regarding industrial waste, energy consumption, CO_2 emission volumes, and PRTR activities have been integrated into JCIA surveys.

- In its voluntary environmental action plan, the Japanese chemical industry has set the target to achieve the reduction of final waste treatment volume by 80% in fiscal 2010 against the fiscal 1990 level. JRCC member companies have been endeavoring setting surpassing targets, and realized reducing waste disposal volumes by 77% in fiscal 2002 compared with the fiscal 1990 level.
- In its voluntary environmental action plan, the Japanese chemical industry has set the target for unit energy consumption levels of 90% of those for fiscal 1990, to be achieved in fiscal 2010. JRCC member companies achieved 91% of fiscal 1990 levels in fiscal 2002.
- Regarding PRTR activities, as the " Law Concerning Reporting, etc., of Release of Specific Chemical Substances to the Environment and Promotion of the Improvement of Their Management " went into effect in April 2001, content regarding government-designated substances has been included in this report. In addition, information has also been included on the Japanese chemical industry's efforts regarding 12 toxic air-polluting substances, which correspond to its Second Term Voluntary Action Plan (the targets of which are average 39% reductions compared with figures for fiscal 1999 to be achieved by fiscal 2003).
- The emission of SOx (sulfur oxides), NOx (nitrogen oxides), Dust and COD (chemical oxygen demand) has been maintained at low levels.
- Investments in environmental preservation measures amounted to approximately \60 billion, maintaining almost the same level as last year, despite sluggish economic condition. The report also describes the environmental accounting which enterprises has been coping with.

● Process Safety and Disaster Prevention ●

- The number of accidents occurred in the member companies slightly fluctuated during the last several years, however, it has been kept almost at the same level, which amounted to more or less 0.4 per member company. Assessing the aging condition of equipment, necessary investments have been implemented, thus utmost care has been taken for process safety and disaster prevention.

● Occupational Safety and Health ●

- The lost time injuries rate at member companies and their contractors was kept below that of the whole manufacturing industry. Its yearly variation shows a downward trend.

● Product Stewardship ●

- 99% of member companies have safety assessment guidelines in place for chemical substances, and also issue Material Safety Data Sheets (MSDSs) for even those chemical substances that are not specified by laws. However, it has come to our attention that it is not always confirmed if MSDSs reach end users. This situation is yet to be resolved.
- JRCC members have participated in High Production Volume (HPV) initiatives and the Long-range Research Initiative (LRI) with chemical enterprises in the world and have contributed to safety of chemical substances as well as assessment of their effect to the environment.

● Distribution Safety ●

- This report introduces the current status concerning members' Yellow Card, Container Yellow Card, and emergency manual systems.

● Communication with Communities ●

- Member companies' efforts to communicate with their respective communities through surveys and case studies are presented with photographs.

● Member Company Activity Survey ●

- This report presents members' initiatives on the current environmental topics such as waste incinerators which attracted attention in relation to dioxins, soil and underground water contamination, etc. It also introduces the current state of member companies' Responsible Care reports (or environmental reports), which are valuable tools for maintaining dialogue with the public and local communities.

● Self-Assessments by Member Companies ●

- This report depicts the result of self-assessments by member companies according to new indicators on seven items such as Management system, Environmental Preservation, Process Safety and Disaster Prevention, etc.. The self-assessments were made in more detail pursuant to the new indicators, by which a continuous improvement of activities has been intended.

● JRCC Activities ●

- This report presents JRCC activities as implemented in cooperation with member companies.
- This report introduces the Safety Awards and Safety Symposiums organized jointly by JCIA and JRCC.
- In the column of " Dialogue with the Public", this report presents the community dialogue held in each part of Japan, and also the dialogue meetings with consumer organizations and with student organizations.
- In an effort to raise the quality of Responsible Care activities and improve reliability, the JRCC has been implementing a third-party verification system. The current status of implementation of the verification is shown.
- Regular members' meetings to exchange their experiences and workshops have been held. In fiscal 2002, the member experience exchange meeting was held at provincial city Okayama for the first time. The JRCC intends to hold the member experience exchange meetings and workshops in line with the needs of member companies.
- As international activities, support for Responsible Care activities in Vietnam and Thailand is presented in this report. Also, reported is a review about Responsible Care activities by ICCA and RCLG conferences.

Environmental Preservation〈Reduction of

Plan for Reduction of Industrial Waste

According to the survey of the status of emission and treatment of industrial waste (results in fiscal 2000) by the Ministry of the Environment, estimated number of remaining years of final disposal sites in Japan total amounted to 3.9 years, which shows a decrease year after year. Social responsibility of enterprisers as emitters, on the other hand, has become heavier year after year.

Since its foundation, the JRCC has worked to reduce industrial waste by setting regulations that integrate waste reduction into each member company's annual and long-term plans. Concurrently, in line with the Keidanren's Voluntary Action Plan on the Environment, the JCIA is working to attain the goal of reducing final waste treatment volumes by approximately 80% compared to fiscal 1990 levels in fiscal 2010.

Each JRCC member company aiming at achieving these targets, has respectively made its reduction plan and strives to implement it. Each member has been progressing synthetically its waste management activities such as enlightenment of its employees' consciousness through establishment of projects and a propelling organization inside the company, or holding presentation meetings, as well as promotion of reduction of generation volumes (reduce), repeated use (reuse), and recycling waste (recycle) through thorough categorization of waste.

Current Progress and Programs for Industrial Waste

◆Reduction of Waste Generation Volumes

Generated volumes of industrial waste in fiscal 2002 represented a 18% decline compared to the fiscal 1990, and a 5.5% decline compared to the fiscal 2001 volumes generated. The results have been steadily improved.

JRCC member companies' collective plans target a reduction of 27% in fiscal 2010 compared with waste generation volumes in fiscal 1990.

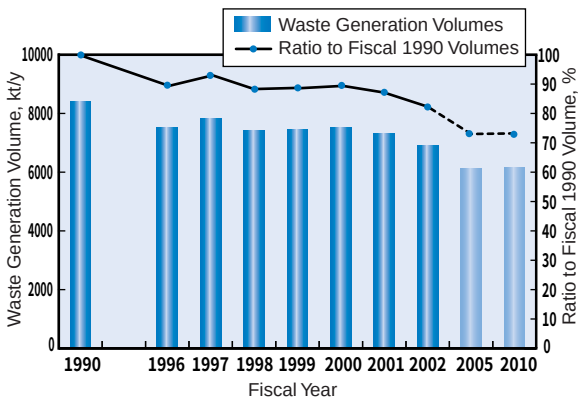
As reduction at generating sources of waste, detailed reviews of manufacturing processes and improvements in facilities have been implemented. Examples of concrete measures are reduction of containers wasted by reuse of raw material containers, volume reduction by condensation of waste liquid, and reduction of generating sludge by introduction of new activated sludge treatment facilities.

◆Effective Resource Usage Rates

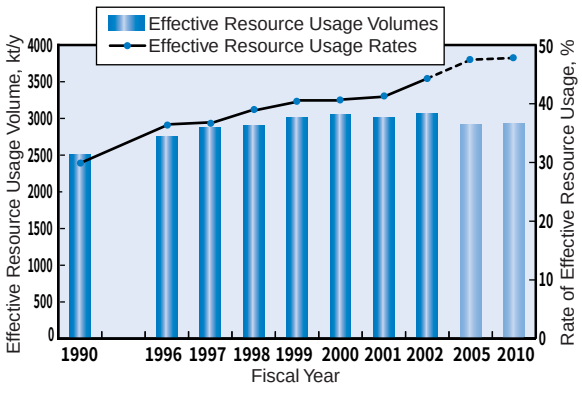
The rate of effective resource usage (ratio of effective use volumes to generated waste volumes) in fiscal 1990 was 30%. In fiscal 2002, this rate was raised to 44%, and the rate planned for fiscal 2010 is 48%.

Each JRCC member company has been actively promoting recycling activities. Implemented examples of effective resource usage are use of inorganic sludge for cement materials, reuse of waste acid and alkali, recovery of waste solvent through distillation, change of waste plastics into solid fuel, chemical recycling, thermal recycling (heat recovery), etc.

Industrial Waste Generation Volumes



Effective Resource Usage Volumes

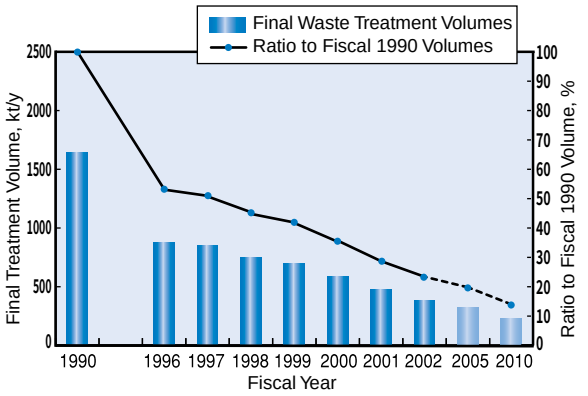


Industrial Waste〉

◆Final Waste Treatment Volume

The volume of final waste treatment for fiscal 2002 was approximately 390,000 tons which represented a 77% reduction compared with the fiscal 1990 figure.
The target for fiscal 2010 is 230,000 tons which represent a 86% reduction compared with the fiscal 1990 figure. This JRCC's fiscal 2010 reduction target is higher than that of the JCIA, which is approximately 80% (both figures derived from 76 member companies).
Together with reduction of final waste treatment volume, appropriate management of waste treatment has been strengthened year after year. Implemented are confirmation of delivery and collection of the industrial waste management card (manifesto) and on-the-spot inspection of final waste disposal places.

Final Waste Treatment Volumes



Case Studies of JRCC Member Companies' Industrial Waste Reduction Efforts

Company A

Surplus sludge generated at the plant was very inefficient having 85% water content, and was finally disposed by landfilling. Detailed investigation on the properties of the sludge has been conducted, approximately 80% volume reduction has been attained by introduction of drying facilities, and now effective use of it has been under study in the direction of recycling.

Company B

For the purpose of reducing general waste generated from business and a variety of waste generated in the manufacturing process, company-wide program was organized and all wastes were investigated in detail. As per item of waste, the company selected an appropriate waste disposal undertaker, in cooperation with whom it classified the waste in recyclable 68 kinds. With all employees' participation, through installation of resource separating stations and implementation of separation patrols, the company not only reduced disposal expenses substantially than before, but also attained zero emission of waste.

Aiming at Establishing a Sound Material-Cycle Society

Each JRCC member company not only strives to reduce waste generated by itself, but also conducts activities for contributing to establishing a sound material-cycle society by its proprietary recycling technology through taking in post use waste outside the company. Examples of those recycling are accepting waste tire to use as fuel for incinerators, accepting waste as cement materials, collection and recycling of expanded polystyrene, thermal recycling of post use plastics, recycling of chlorine and bromine from collected waste liquid, recycling of waste TV glass, recycling of fibers by chemical recycling, building-up of waste paint recycling system, etc.

Environmental Preservation〈Energy Saving,

Based on the Keidanren's Voluntary Action Plan on the Environment, the JCIA is currently striving to reduce unit energy consumption to 90% of that in fiscal 1990 by fiscal 2010.
The accompanying graphs are based on data collected from 85 member companies. Unit energy consumption has been improving steadily since fiscal 1990. In fiscal 2002, unit energy consumption decreased by 0.5% compared with fiscal 2001 due to increase of production (Production index increased by 2%.)
Although production in fiscal 2002 was 119% of that of fiscal 1990, CO_2 emissions were kept to 109.9% due to improved unit energy consumption.
(Unit energy consumption is based on the energy required for manufacturing divided by production volume. A production index is a comparison of figures to their fiscal 1990 counterparts made to determine annual energy consumption based on the presumption that unit energy consumption will not have improved.)

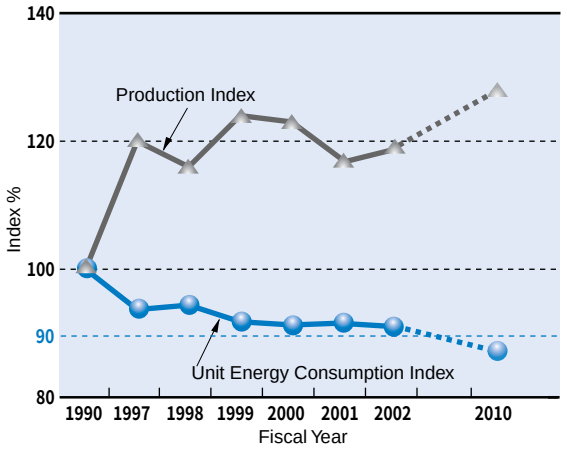
Energy consumption volumes and CO_2 emission volumes have increased since fiscal 1990. However, these figures have started to level off or to decline slightly since fiscal 1997 after JRCC was established. It is still expected for JRCC member companies to continue their efforts to reduce them.

〈Factor Analysis of CO_2 Emission Volume Increase〉
Although unit energy consumption decreased by 9% in 2002 compared with 1990, CO_2 emission volumes increased by 9.9% in 2002 compared with 1990. Its main factors can be analyzed as follows:

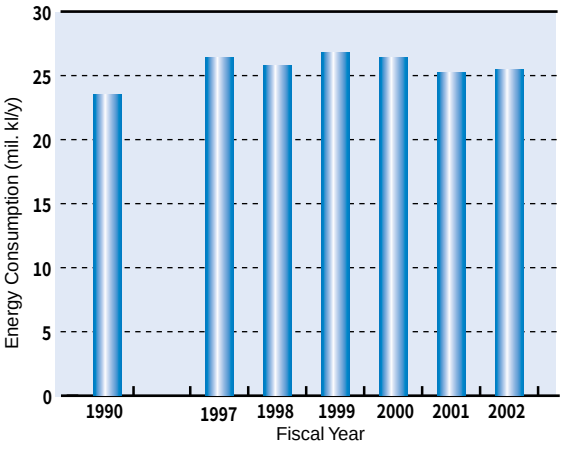
Increase by expansion of production	19.0%
Save energy efforts by JRCC members	- 8.8%
Improvement by purchased power unit	- 0.3%
Change in CO_2 emission volumes	9.9% (Increase)

(Reference) It was decided at the COP3 conference (the 3rd Session of the Conference of the Parties to the UN Framework Convention on Climate Change), held in December 1997, that all countries would reduce their volumes of greenhouse gas emissions (including Carbon dioxide, Nitrogen Monoxide, Methane, Hydrofluorocarbons, Perfluorocarbons and Sulfur hexafluoride. In line with this decision, it was decreed that Japan would reduce its overall emissions of these greenhouse gases by 6% compared to 1990 levels in the commitment period of 2008 to 2012. "Outline of Countermeasures against Global Warming" was adopted at the Cabinet in March 2002 in preparation for the ratification of Kyoto Protocol to the United Nations Framework Convention on Climate Change, and it stipulated targets for each sector (industries, transportation, civil) in order to attain the reduction of volumes of greenhouse gas emissions by 6% compared to 1990 levels as a whole nation. The industrial sector has already made considerable efforts for reduction of emissions but more efforts will be required as the industrial sector is responsible for 40% of the total emission volumes of the whole country. In May 2002, the Kyoto Protocol was ratified in the diet as proposed. At the same time Revised Global Warming Countermeasure Promotion Law (brief name) was promulgated and enforced, commencing practical move toward attaining the goal set by the Kyoto Protocol.

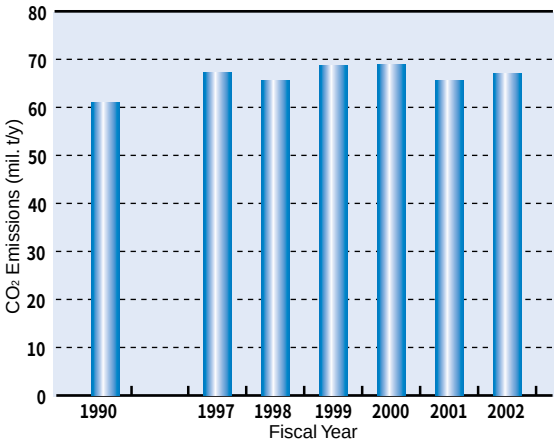
Trends and Forecasts in Unit Energy Consumption Index and Production Index



Energy Consumption Transition (as crude oil)



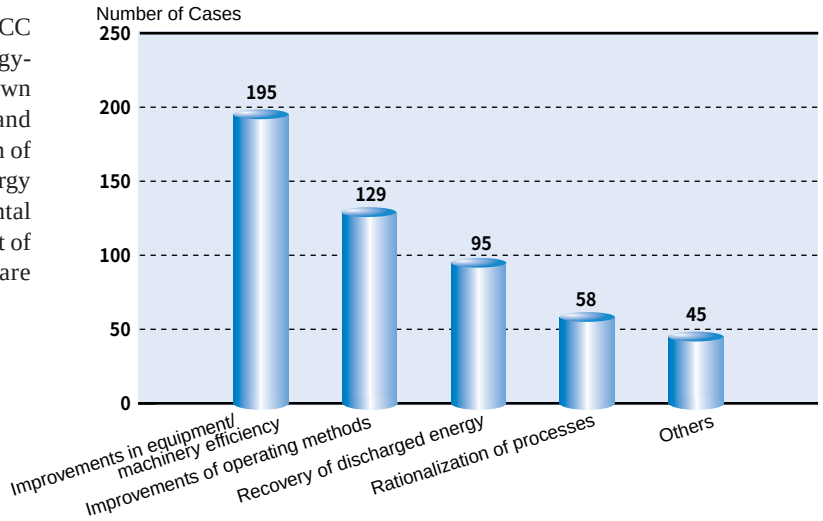
CO_2 Emission Transition



CO_2 Emission Control〉

Energy-Saving Achievements

Actual measures taken by JRCC member companies for energy-saving in fiscal 2002 are shown in the graph on the right hand side as a result of compilation of JCIA's "Voluntary Save-Energy Action Plan for Environmental Conservation," in which most of JRCC member companies are participating.



Other Global Warming Countermeasures

(1) Contributions to civil and transportation sectors

JRCC member companies not only have been taking initiatives on CO_2 emission control, but also have been developing products and services contributing to energy saving/CO_2 emission control.

- Modal shifting (conversion from transportation by truck to higher energy efficiency mass transportation by sea or rail) in raw materials and products distribution.
- Upgrading of automobile's fuel consumption rate by developing materials for green tires.
- Upgrading of air conditioning effect by developing insulation materials for houses.
- Development of clothing material which enables to stay comfortably in a mildly cooled (in summer) or mildly heated (in winter) room.
- Development and manufacture of substitute fuel generating less volume of CO_2.

(2) Countermeasures against Greenhouse Gases other than CO_2

The following initiatives are being implemented to restrict emissions of greenhouse gases other than CO_2 :

- Development of alternatives
- Reuse of recovered gases and development of disposal technologies for non-reusable gases in concert with the industries in which they are used
- Sealing of plants and facilities and intensification of equipment inspections for preventive and protective measures against leakage from plants. Exclusive use of filling lines.
- Increase of container size and recovery of left-over gas in gas cylinders to return.

Progress of Environmental Preservation Measures in Overseas Business Activities

In overseas business activities of JRCC member companies, laws and regulations on "Environment, Safety and Health" of respective country must of course be observed, and JRCC member companies are endeavoring to transfer the latest energy-saving and environmental preservation technologies, processing technologies and high-efficiency machinery.

Environmental Preservation 〈The PRTR System

PRTR (Pollutant Release and Transfer Register) is a system that enterprises for themselves assess and compile quantitative data on many kinds of chemical substances potentially harmful to human beings and ecological systems that are released into the environment (air, water and soil), whether they are contained in wastes or otherwise transported out of business facilities, and the enterprises report the data to the Government, which adds up and publishes the released quantities and transported quantities based on the data submitted by the enterprises and its estimation.

PRTR is expected to have versatile significances as follows:

(1) Improvements in voluntary control on chemical substances by enterprises

(2) Data for administration to make priority judgment on measures to be taken to control chemical substances.

(3) Enhancement of understanding about release and control situation of chemical substances through information disclosure to the people.

(4) Basic data for environmental conservation

(5) Acknowledgement of effects and progress of environmental conservation activities concerning chemical substances.

The publication of information can be useful in assessing danger levels and identifying latent dangers to people and the environment by clearly stating volumes and sources of release or transfer to the environment of specified substances.
PRTR has been legalized in the USA, Holland, etc. OECD (Organization for Economic Cooperation and Development) advised the member countries to legalize PRTR in 1996. In Japan the Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (the PRTR Law) was issued in July 1999 and went into effect on March 30, 2000. Assessment of the volumes of the 354 chemical substances specified by the law was commenced in fiscal 2001. Data reporting started in fiscal 2002 and the initial government disclosure was publicized in March 2003.

History of JCIA Voluntary PRTR Efforts

The JCIA has long considered the reduction of emissions into the environment essential to the chemical industry's gaining of public trust. In 1992 the JCIA conducted survey on PRTR programs in other countries and started a pilot survey on 13 chemical substances in Japan. In 1994, JCIA established survey guidelines, compiled basics of calculation methods to commence survey, and announced the survey results at the Chemical Product Council. The object chemicals for survey increased gradually and reached 284 substances in 1998. JCIA disclosed for the first time the top 5 substances of the greatest emission volumes in each prefecture in 1998. The object substances for survey have reached 480 kinds since 2000, including 354 chemical substances specified by the PRTR Law without counting double such substances specified by both PRTR and JCIA.
The JRCC also conducts surveys to assess the emission and transfer volumes not only of chemical substances specified by the PRTR Law, but also of those chemical substances specified by the JCIA of its own volition. Based on these data the JRCC will proactively promote such actions as leakage prevention, the improvement of waste collection and recycling rates, and the conversion to alternative substances.

Selected JCIA PRTR Survey Results

The first table in the next page shows a compilation of the actual emission volumes and externally treated volumes in fiscal 2002 of such substances included in the legally specified substances that exceeded 1000 tons per year in total of JRCC members' emission volumes in fiscal 2000.
Of the top 10 substances that exceeded 1000 tons in their emission volumes in fiscal 2000, their half 5 substances have turned down to less than 1000 tons emissions.
Summing up all the 354 survey substances, the total emission volumes in fiscal 2002 were about 25,735 tons, which is a reduction of about 36% compared with that in fiscal 2000. As detailed in the table, about 87% were emitted into air, about 13% into waters, and about 0.15% into soil in fiscal 2002.
The majority of emission volumes are emissions into the air. The successive challenge is to further reduce the emission volumes into the air.

Selected PRTR Survey Results

Upper Line: Fiscal 2002 (Tons/Year)
Middle Line:Fiscal 2001 (Tons/Year)
Lower Line: Fiscal 2000 (Tons/Year)

1. Emission Volumes and Externally Treated Waste Volumes of Major PRTR Substances

Substance	Emission Volumes				Externally Treated Waste Volumes			Number of Handlers (Companies)
	Air	Water	Soil	Total	Volume Transferred	Volume Recycled	Total	
Toluene	**5,764**	**39**	**14**	**5,817**	**7,893**	**2,953**	**10,846**	**74**
	6,032	67	12	6,111	5,989	3,718	9,707	67
	5,640	196	0	5,836	4,700	9,160	13,860	67
Dichloro-methane	**2,392**	**1**	**0**	**2,393**	**776**	**2,022**	**2,798**	**46**
	3,309	4	0	3,313	1,173	610	1,783	52
	4,030	7	0	4,037	928	540	1,468	47
Chloromethane	**1,779**	**1**	**0**	**1,781**	**28**	**0**	**28**	**26**
	2,077	1	0	2,078	65	5	70	23
	2,730	20	0	2,750	50	0	50	26
Carbon disulfide	**210**	**0**	**0**	**210**	**2**	**0**	**2**	**9**
	858	2	0	860	3	0	3	10
	2,010	7	0	2,017	0	0	0	10
Vinyl acetate	**1,146**	**34**	**0**	**1,179**	**199**	**481**	**680**	**29**
	1,148	12	0	1,160	751	948	1,699	30
	1,610	48	0	1,658	2,450	738	3,188	33
Xylene	**1,156**	**52**	**0**	**1,208**	**2,242**	**633**	**2,875**	**71**
	1,334	8	0	1,342	2,102	850	2,952	63
	1,570	33	0	1,603	2,250	2,860	5,110	66
Dimethyl-formamide	**399**	**292**	**0**	**691**	**2,267**	**1,622**	**3,889**	**46**
	1,114	154	2	1,270	2,086	1,240	3,326	43
	1,430	156	0	1,586	1,250	1,680	2,930	44
HCFC-142b	**802**	**0**	**0**	**802**	**0**	**0**	**0**	**7**
	872	0	0	872	0	0	0	7
	1,560	0	0	1,560	0	0	0	6
Styrene	**889**	**3**	**0**	**892**	**1,084**	**882**	**1,966**	**50**
	966	4	0	970	639	310	949	47
	1,350	188	0	1,538	1,210	1,060	2,270	48
HCFC-22	**488**	**3**	**0**	**491**	**0**	**0**	**0**	**12**
	878	2	0	880	0	0	0	10
	1,340	73	0	1,413	3	0	3	10

● Listed are those top 10 substances which exceeded 1000 tons/year in their emission volumes of JRCC member companies in fiscal 2000 out of PRTR specified substances.

2. Totals of Emission Volumes and Externally Treated Volumes of PRTR Specified Substances (354 Substances)

	Emission Volumes (T/Y)				Externally Treated Volumes (T/Y)		
	Air	Water	Soil	Total	Volume Transferred	Volume Recycled	Total
PRTR Substances Total	**23,320**	**2,352**	**63**	**25,735**	**31,242**	**16,497**	**47,739**
	27,590	2,739	32	30,361	39,246	15,624	54,870
	36,560	3,585	0	40,145	33,651	33,737	67,388

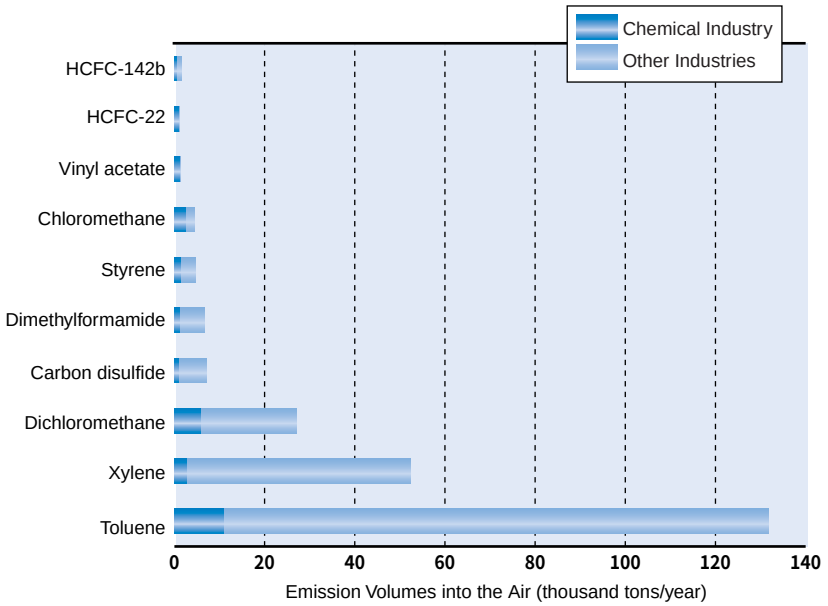
Totals of Emission Volumes and Externally Treated Waste Volumes of JRCC Survey Substances (480 Substances)

	Emission Volumes (T/Y)				Externally Treated Volumes (T/Y)		
	Air	Water	Soil	Total	Volume Transferred	Volume Recycled	Total
JRCC Survey Substances Total	**58,334**	**8,895**	**120**	**67,331**	**82,317**	**127,062**	**209,379**
	67,300	7,685	70	75,055	88,406	80,699	169,105
	78,070	12,567	1	90,638	65,524	94,915	160,439

Environmental Preservation
〈The PRTR System and Industry Efforts〉

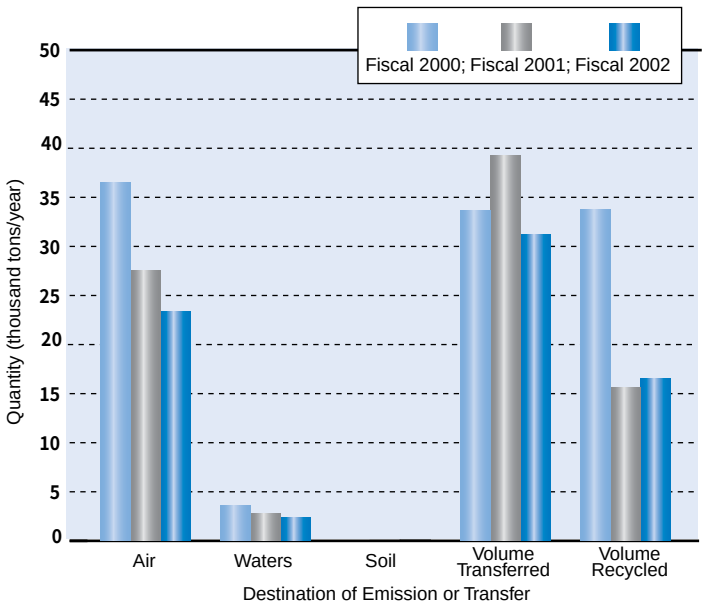
The graph shows, comparing "chemical industry" classification with "other industries" classification, about high emission volume substances at JRCC member companies in terms of emissions into the air from the PRTR survey results for fiscal 2001 which the government publicized in March 2003. It demonstrates that industries other than the chemical industry emit into the air significant volumes of Toluene, Xylene, etc.

Chemical Industry's Proportion at Emission into the Air



The graph shows yearly transition as per destination of emission or transfer of all 354 substances of PRTR specified chemical substances which JRCC treats as survey substances. It indicates a decreasing tendency of emissions into the air and waters.

Transition of Volumes of Emission and Transferred of All 354 PRTR Specified Substances at JRCC Member Companies



Environmental Preservation
〈Air Pollutants Control〉

JRCC member companies have been pushing forward to preferentially reduce their emissions of the voluntary management 12 substances of harmful air pollutants.

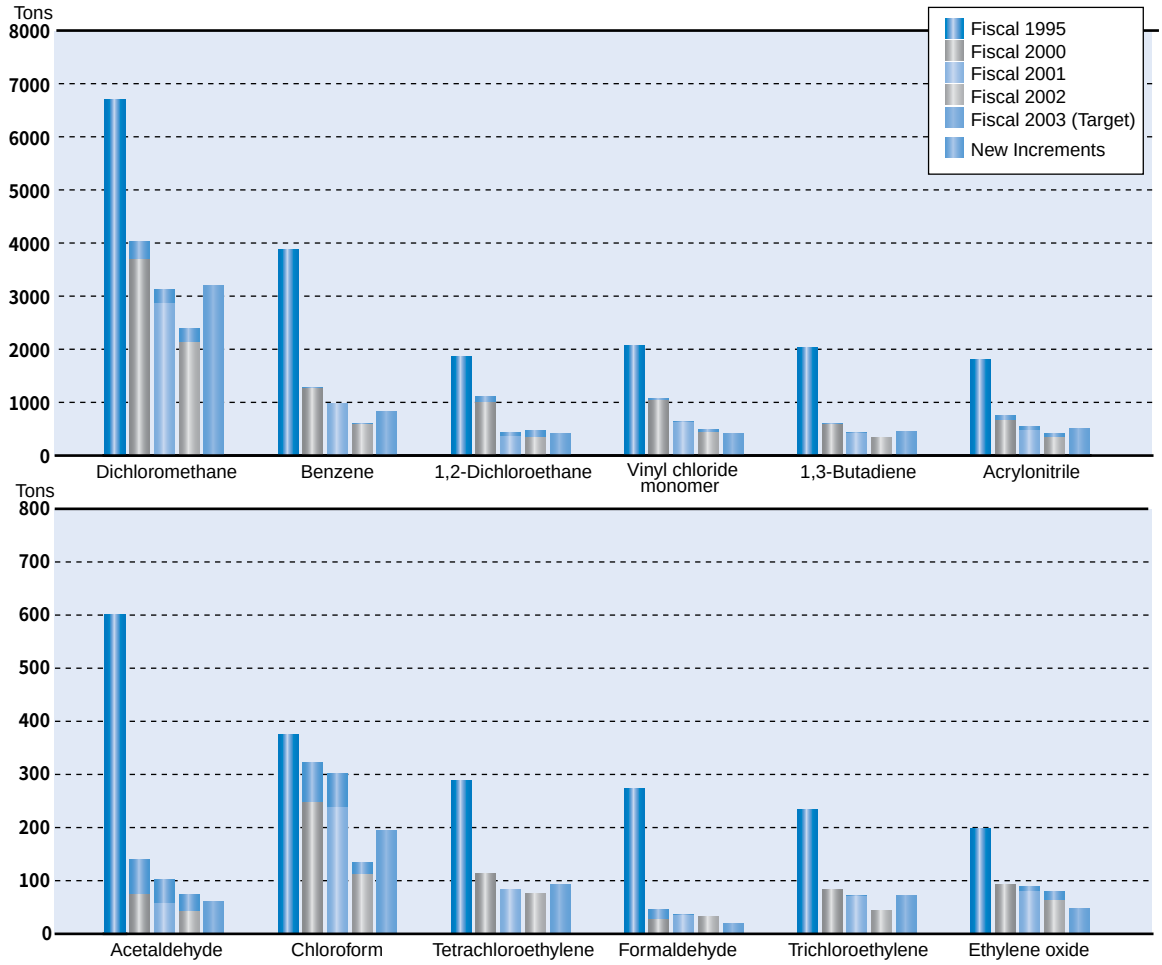
Reference

The 12 substances were selected from the list of 22 harmful air pollutants compiled by the Central Environmental Council (set in Ministry of the Environment, managing important issues concerning environmental preservation, etc.). The substances selected are deemed potentially carcinogenic, are produced or imported in quantities above a specified amount, have inspection data available regarding the amount of said substance in the environment, and are voluntarily managed by businesses. The chemical industry has replaced nickel compounds with ethylene oxide.

◆ Voluntary Management Plan (Second Term)

The chemical industry centering the JCIA drew up the first term voluntary management plan. The JRCC also set a reduction target for each substance to be achieved in fiscal year 1999 on the basis of the criteria year of 1995 and has taken the initiative in reducing emission volumes of the specified substances to be handled with priority.
The graph below was made on the basis of the number of companies provided data in 1995 as the base number, piling up those increased thereafter as “new increments.”
Advisory panels of the Japanese Ministry of Economy, Trade and Industry and Ministry of the Environment highly evaluated the efforts made by the chemical industry during the first term of the JCIA plan but also stated that voluntary emission reduction efforts had to be continued and further emission reductions were necessary.
In response, the JRCC newly laid out a second-term voluntary management plan which designated 2003 as its final year. As shown in the following graphs, JRCC member companies have been pushing forward with voluntary measures to attain the targeted second-term emission reductions (13~71% reductions compared with figures for fiscal 1999 to be achieved by fiscal 2003) and have been making good progress.

Transition of Emission Volumes of Harmful Air Pollutant 12 Substances



Environmental Preservation
〈Air and Water Quality〉

During the 1970s, the chemical industry strove to prevent pollution and achieved substantial reduction of air and water pollutants emission. Similarly after 1995, the chemical industry has continued to strive to maintain lower emission levels than official standards by complying with agreements with local governments and setting up its own standards severer than legal restrictions.
Although increases in production volumes and expansion in JRCC membership have some effects, annual emission volumes of each pollutant into the air or waters have either remained generally on the same level or slightly lower level, owing to the incessant efforts of the member companies.

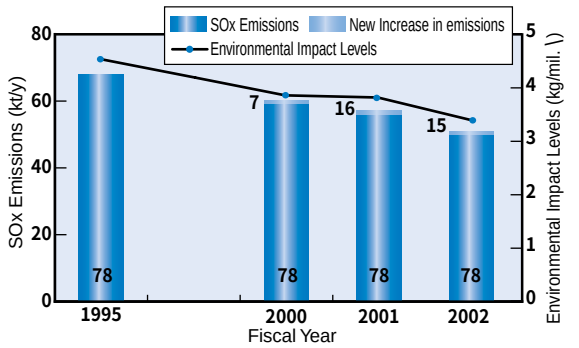
◆ Air

SOx (sulfur oxides), NOx (nitrogen oxides), soot and dust are generated when fuels or other materials are combusted. As these substances could be harmful to human health, the chemical industry, in addition to complying with national and local governments, has made efforts to voluntarily reduce their emission volumes and has achieved the reduction of emissions at a high rate from the world standards by improving combustion equipment, adopting removal devices of harmful substances and so forth.

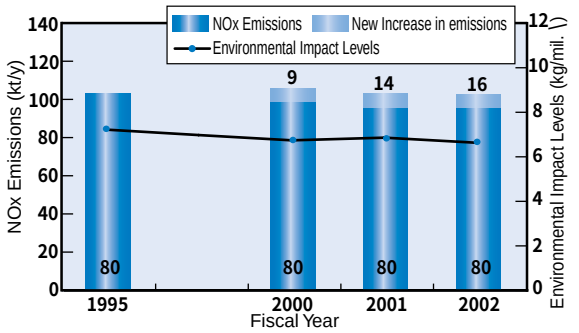
◆ Waters

COD (chemical oxygen demand) is an indicator of water pollution by organic substances. Waste water containing organic substances from manufacturing plants is released into rivers and seas only after these organic substances have substantially been reduced through waste water treatment using the activated sludge process or adsorption agents. As shown in the right chart, emission volume of COD is on the downward trend for the last three years.
Other indicators of water pollution are concentration levels of phosphorus, nitrogen, and suspended substances. JRCC members companies' levels for all of these indicators are below standards stipulated by legal restrictions and local government protocols.
JRCC started to take the initiative to reduce emission volumes of total phosphorus and total nitrogen designating fiscal 2001 as its first year. Making a comparison by a total of the companies with complete data for the last two years, the emission volume of total phosphorus was 1,000 tons and that of total nitrogen was 30,563 tons in fiscal 2001, which respectively turned out to be on the decrease in fiscal 2002 to 931 tons of total phosphorus and 27,311 of total nitrogen.

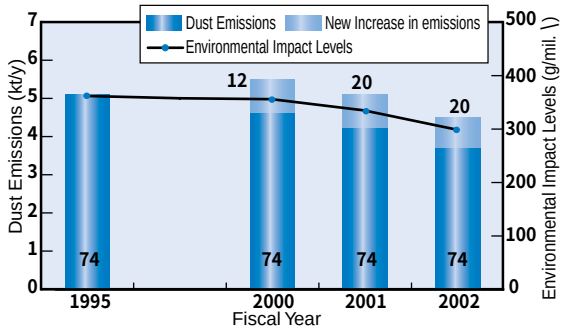
SOx Emissions



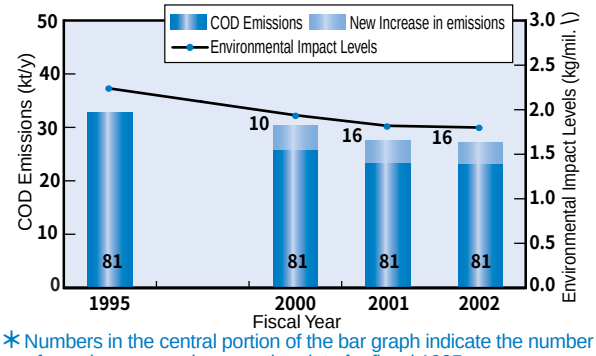
NOx Emissions



Dust Emissions



COD Emissions



* Numbers in the central portion of the bar graph indicate the number of member companies reporting data for fiscal 1995.
* Numbers in the upper portion of the bar graph indicate the increase in the number of member companies reporting data compared to fiscal 1995.
* Environmental Impact Levels: Business fields of member companies vary so much that environmental impact levels could not be expressed by the same production volume unit, therefore they were compiled by sales amounts (million yen).

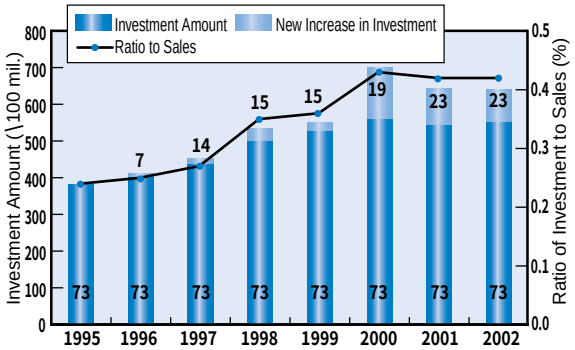
Environmental Preservation

〈Investment in Environmental Preservation〉

The amount of investment in environmental preservation and its ratio to sales in fiscal 2002 turned out to be almost on the same level as those of the previous fiscal year (refer to the right chart). Despite the continuity of dull economic situation, JRCC member companies have continuously invested for environmental preservation and have continued their efforts for the environmental preservation.

The chart on the right shows the breakdown of the investment in fiscal 2002. Approximately 50% of total investment comprises such conventional pollution prevention as those for the improvement of water quality (COD, etc.), air quality (SOx, NOx, soot and dust, etc.), noise, vibration, and offensive odors. Steady investments have also been made for such comparatively new environmental issues as prevention of global warming, measures for harmful substances (PRTR law specified substances, etc.) emission, measures to prevent soil and underground water pollution, and so forth.

Investment in Environmental Preservation



* Numbers in the central portion of the bar graph indicate the number of member companies reporting data for fiscal 1995.
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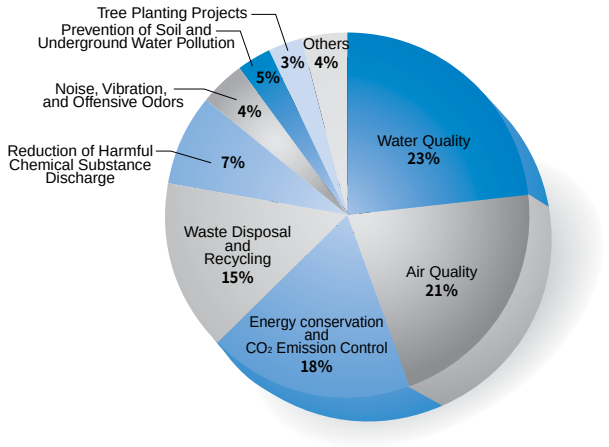
Investment in Environmental Preservation for fiscal 2002



Environmental Accounting

In the latter half of 1990s several enterprises independently studied environmental accounting, and started its introduction and publication.

Environmental accounting is a means for enterprises to grasp costs for environmental preservation and benefits obtained by their activities for it, and to quantify relevant information (amounts and quantity) as much as possible. Through the analysis of the environmental accounting, enterprises would be able have judgment materials for conducting environmental preservation activities efficiently and effectively while striving for their sustainable development and maintaining good relations with the public. In addition, through disclosure of such information, decision making of the interested parties such as consumers, local residents, and investors may be influenced.

The Ministry of the Environment published last year " Environmental Accounting Guidebook 2002 Edition". As this was meant to be utilized generally by any industry, the JRCC started activities by a working group on environmental accounting and has been making its own " Environmental accounting computation guideline" incorporating characteristic conditions as the chemical industry. Introduction of this guideline will give such merits as to facilitate comparison between JRCC member companies**,** and what not. Therefore, the JRCC will take the initiative in promoting to utilize this guideline in various relating industries including JRCC member companies.

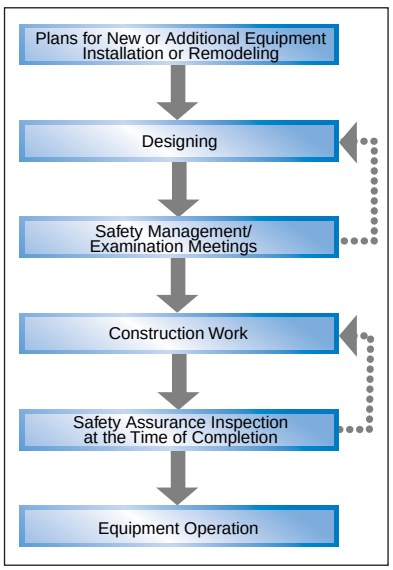
The number of companies that have already introduced environmental accounting has been on the increase trend, and the environmental accounting attracts attention likewise internationally. As a result, various government organizations and laboratories including UN have been conducting research and study on it.

Process Safety and Disaster Prevention

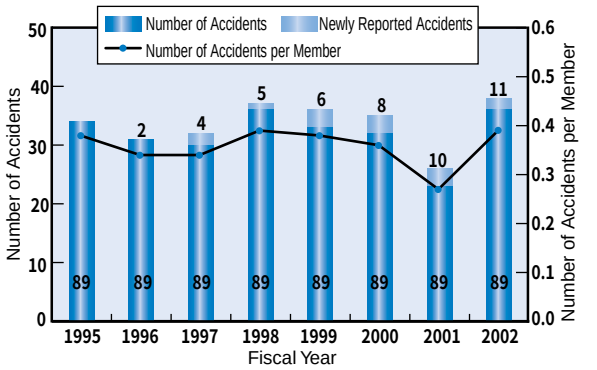
The number of plant accidents per a member company has shown a decreasing trend for the last three four years, but it increased in fiscal 2002, equivalent to the status level in fiscal 1998.
Investment by members in process safety and disaster prevention in fiscal 2002 kept high level both in the aggregate amount and in ratio to sales, and it has been on the upward trend.
To prevent disasters and to insure operations safety, each member company has been implementing such safety measures under the system appropriate to each company's business contents as Engineering safety measures (Prior safety assessment, Facility automation, Multiple security system, Periodical maintenance checkup, Measures for natural calamity such as earthquake) and Administrative safety measures (Preparation and clear statement of safety guideline and manuals, Education of employees on safety matters, Hazard prediction, Improvement of working environment, and Periodical auditing).

[Prior Facilities Management and Assessment]

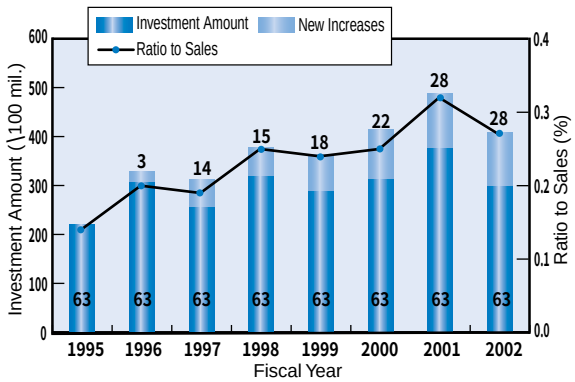
As a result of survey by questionnaire, it turned out that more than 80% of member companies had some assessment criteria and conducted prior facilities safety assessment. In case of installing new or additional equipment or of remodeling equipment, member companies set up a place to examine and inspect safety before starting the construction work and implement a prior thorough check to eliminate or minimize any dangers including latent ones, and when the work finishes, they assure certain implementation of prior checked measures. Thus they make efforts for plant accident prevention.



Plant Accidents (explosions, fires, leaks ,etc.)



Investment in Safety and Disaster Prevention



* Numbers in the central portion of the bar graph indicate the number of member companies reporting data for fiscal 1995.
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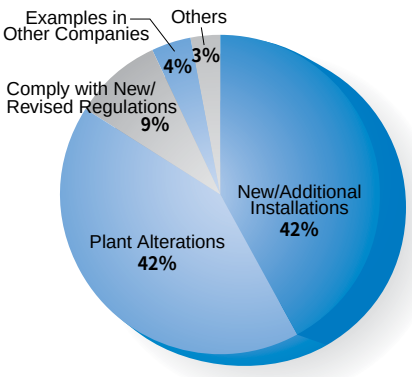
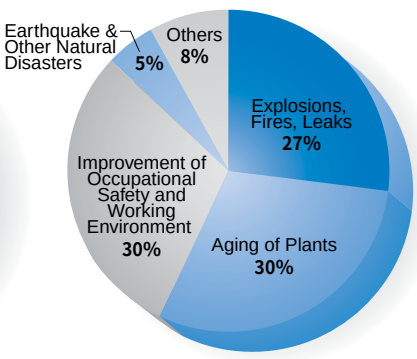
Reasons for Prior Plant Safety Assessments in Fiscal 2002



Investment in Process Safety and Disaster Prevention Measures in Fiscal 2002



[As Regards Voluntary Security Inspection]

Illegality turned out from June to August 2003 on the voluntary security inspection which a part of member companies made in the past as an approved undertaker based on High Pressure Gas Safety Law. It goes without saying that the law should be abided by on the one hand, but voluntary management is a fundamental theme of Responsible Care on the other hand. Taking this opportunity, for the purpose of preventing recurrence JRCC intends to further lift up the level of Responsible Care activities.

Occupational Health and Safety

Labor accidents have substantially decreased in number both in all manufacturing industries and in all chemical industries since 1970s (Ministry of Health, Labour and Welfare survey). In addition, the lost time injuries rate of JRCC member companies and member company contractors has generally been on the slightly downward trend since 1995, being lower than the manufacturing industry average.

As regards the severity rate, especially member company contractors' decreasing trend has continued and its rate is approaching to the member companies' rate. This can be conceived as a result of the effort for the safety measures by each member company's whole group.

However, continuous efforts should be required hereafter the same as before for attaining zero accident and for maintaining the status.

◆ Number of Fatalities

	1995	1996	1997	1998	1999	2000	2001	2002
Member Companies (JRCC)	2	3	4	3	3	2	1	1
Member Company Contractors (JRCC)	4	6	5	9	4	1	3	1
Chemical Industry (MHLW)	35	39	34	30	28	26	24	27
Manufacturing sector (MHLW)	417	405	351	305	344	323	326	275

MHLW=Ministry of Health, Labour and Welfare

Number of fatalities also declined during these several years.

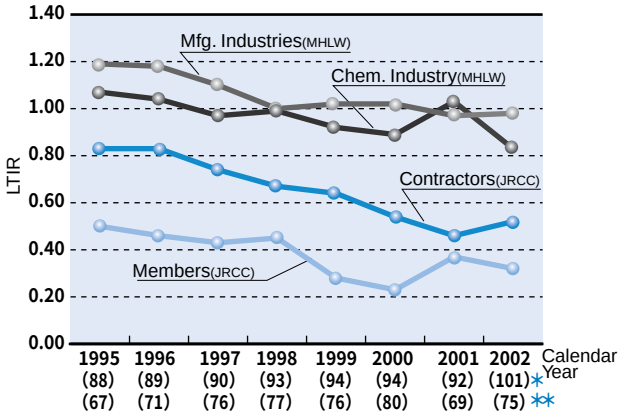
◆ Introduction of Occupational Safety and Health Management System (OSHMS)

The movement to eliminate labor accidents has been intensified year after year by the introduction of OSHMS, a management system to continuously and independently pursue safety and health control based on the PDCA (plan, do, check, and act) cycle, and accordingly by intending to reduce latent dangers and to raise safety and health levels. Results of a questionnaire survey are as shown below.

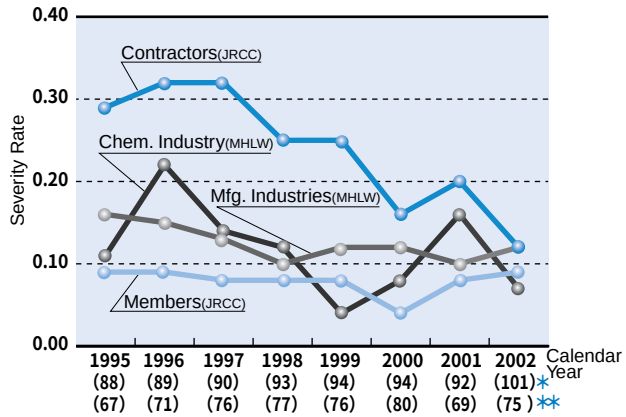
- ○Members that have already introduced OSHMS: 23% (previous year 15%)
- ○ Members considering introducing OSHMS: 40% (previous year 46%)

Thus, the number of the member companies that have already introduced OSHMS increased to 23% from 15% in the previous year, approximately tripled compared to two years ago. Also, 26% of the member companies that have already introduced OSHMS responded that they had already obtained its validation or had the plan.

Lost Time Injuries Rates



Severity Rates



* Figures in parentheses show the number of member companies.

** Figures in parentheses show the number of contractors surveyed.

Frequency Rate = Number of lost time injuries / One million working hours

Severity Rate = Lost days / One thousand working hours

Chemical and Product Safety

To secure Health, Safety and Environment at all stages from product development through disposal by way of manufacture, distribution, use and final consumption, each JRCC member company strives to implement comprehensive voluntary safety management of chemical substances through prior safety assessments, MSDS compilations, etc.

Examples of Environmental and Safety Efforts

* **Providing Information:** Promoting enlightenment and pervasion of applying MSDSs. Emergency Response Cards (Yellow Cards), and product labels.
  - Sept. 2000 to Mar. 2001 Dispatched JCIA speakers to 47 Metropolis and Districts Chemical Substance Managers' Training held by the Japan Industry Safety and Health Association. Provided the New Occupational Health and Safety Guidelines as part of text materials.
  - October 2001 Issued updated version of the Material Safety Data Sheet Guidelines.
  - August 2003 JCIA held Hazardous Materials Transportation Seminar.
* **Safety Assessments**: Conducting prior safety assessments of chemical substances, and Development and Training of Risk Assessment System.
  - July 2001 Published "Chemical Substance Risk Assessment Manual for the Prevention of Laborer Health Impairment" followed by explanatory lectures in September and October 2001.
  - June 2002 Launched "Chemicals Risk Management Study Group" . Started educational activities for training risk assessment conductors. (Participants as at August 2003: 48 companies, 4 groups)
  - January 2003 Announced a risk assessment system "PRTR Specified Substances Simple Assessment System" . Held a short course for users.
* **Safety Management**: Promotion of voluntary plans for air pollutant control, risk management and risk reduction plans.
  - May 2000 Issued "New Occupational Health and Safety Guidelines". Held explanatory meetings in July 2000.
  - January 2001 Issued "Chemical Substance Safety Measures Circulation Manual" (A contract with the Japan Small and Medium Enterprise Corporation).
  - January 2001 Issued "Chemical Substance Emission Volume Calculation Manual (Chemical Industry Section)".
  - February 2001 Issued "Emergency Response Guideline" for application to container yellow cards (labels) (JCIA).
  - April 2003 Revised "Guideline for Preventing Health Impairment by Chemical Substances" (JCIA/JRCC).

Results of Prior Chemical Substance Safety Assessments

• Motives for Prior Safety Assessments:

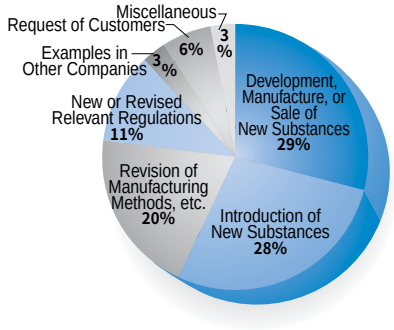
Prior chemical substance safety assessments are applied to the existing products as well as new chemical substances. The assessments have been made, focusing on safety of chemical substances (explosion, fire, acute and chronic toxicity, etc.), concerning the effects to the people handling them and to the environment, based on "the JCIA's Guiding Principles for the Improvement of Environmental, Safety and Health Conditions".

The prior chemical substance safety assessments are useful not only for risk reduction measures but also for response in emergencies.

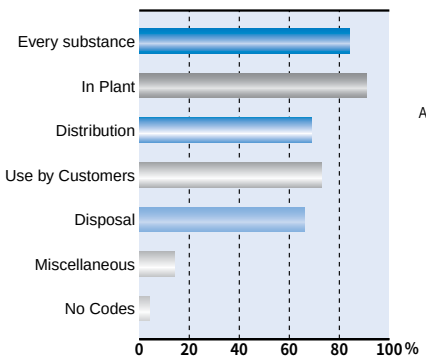
• Implementation Codes of Prior Safety Assessments:

99% of JRCC member companies have their own prior safety assessment codes. Their objects and bases are as follows:

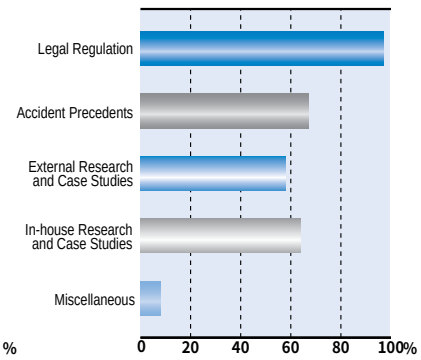
Motives for Conducting Prior Safety Assessments



Objects of Codes of Prior Safety Assessments (Plural Replies)



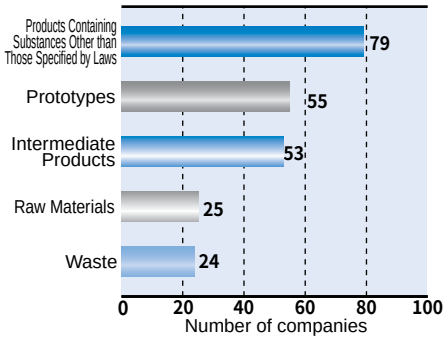
Basis of Codes of Prior Safety Assessment (Plural Replies)



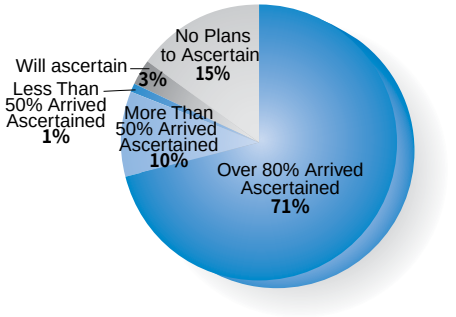
Status of Maintenance and Distribution of Material Safety Data Sheet (MSDS)

MSDS is a document describing not only fundamental information such as the name of chemical substance contained in the product, its rate of content, melting and boiling points, etc., but also necessary measures at the time of leakage of chemical substances, necessary care at handling and storage, necessary attention at the time of disposal or during distribution, etc.

MSDS Application to Substances Other than Those Specified by Laws



Arrival of MSDS at Customers



• Legal Requirements of MSDS Distribution

The chemical substances specified by the following laws require delivery of MSDSs, their distribution to people handling such substances, making them known, etc.:

Applicable Laws:

* Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (Pollutants Release and Transfer Register - PRTR Law)
* Industrial Health and Safety Law
* Poisonous and Deleterious Substances Control Law

• Response to Substances Other than Those Specified by Laws

JRCC member companies voluntarily issue MSDSs for products, prototypes, and intermediate products of other substances than those specified by laws as shown above.

• Contents of Revised MSDS

MSDS is revised from time to time based on amendment of relevant laws, acquisition of new risk information, provision of information from manufacturers, etc.

• Arrival of MSDS at Customers

79 of JRCC member companies traced and ascertained arrivals of MSDS at end-users.

Results of Tracing:

Over 80% arrived	:	71% of member companies ascertained arrival.
Over 50% arrived	:	10% of member companies ascertained arrival.
Less than 50% arrived	:	1% of member companies ascertained arrival.

Surveys and Research on Chemical Substance Safety – Efforts for HPV and LRI–

Organization for Economic Cooperation and Development (OECD) has been proceeding with the project about the substances lacking basic safety data to acquire data and to make initial hazard assessments preferentially from the existing chemical substances with a large scale of production (HPV: High Production Volume Chemicals, annual production volume: not less than 1,000 tons). The ICCA has been supporting this project as one of the Responsible Care activities, in which a large number of JRCC member companies has participated.

Japan, U.S.A., and Europe set up a international consortium, which has been conducting hazard assessments targeting 1,000 substances. Japan has taken a role of international leader in many substances, and has been highly appreciated up to now, but the pace tends to be slowing down recently.

As delay in progress looks to be seen even at ICCA as a whole due to circumstances not only in the industry but also at OECD or each state government, JCIA chairman sent “a document regarding promotion of ICCA HPV initiative” to respective presidents of member companies. He urged to positively take international leadership in order not to lose high evaluation on Japan toward the future.

Further, the LRI (Long-range Research Initiative) signifies long-term research on “the effects of chemical substances on human health and the environment” which the chemical industries of Japan, United States, and Europe have cooperatively been proceeding with and LRI has been making research on endocrine disrupters, carcinogenesis, chemical hypersensitivity, etc. JRCC member companies likewise have contributed to these researches. The status of LRI activities can be viewed on the JCIA’s web site: **http://www.nikkakyo.org/organizations/lri/index.php3**

Distribution Safety

For the purpose of decreasing risks during transportation of chemicals which may influence on the environment, the JRCC has continuously taken steps to urge the persons concerned such as workers at business sites, transporters, contractors, etc. to prepare Yellow Card (Emergency response card), to carry it with them without fail, and at the same time to make them readily take appropriate measures in an emergency according to the Yellow Card.

◆Status of Preparation of Yellow Card/Label in Emergency

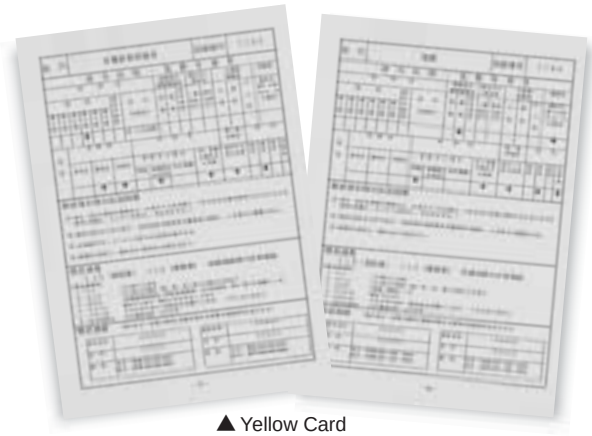
There exists an Emergency response card that contains information on appropriate measures for the persons concerned such as trailer drivers, fire fighters, and policemen to take should an accident occur during transportation of chemical substances and high pressure gases. As written on yellow card, this card is called “Yellow Card”.
Meanwhile, in the case of transportation by consolidation or vessel transportation of small quantity, UN number and/or emergency measure guideline number are occasionally added to the label affixed to the container, which is called “Container Yellow Card”.

Status of Carrying Yellow Card

Replies were received from 97 member companies. Of these, 92% of members carried Yellow Card at the time of delivery, but more or less 8% of them were unascertained.

Status of Implementing Container Yellow Card (Labeling Style)

Container Yellow Card system started to be put in practice in fiscal 2002. Replies were received from 88 member companies. Of these, 60% of them were still considering the introduction, but considering the initial year, more than anticipated 40% of them, although it is still a part of them, put the Container Yellow Card in practice.



▲ Yellow Card

▲ Example of Container Yellow Card (Small container)

◆Emergency Manual/Communication System/Training Status

Member companies have been making efforts to secure safety during transportation by setting up 24 hours emergency communication system and joint accident response services between a fire department/police and related enterprises as well as by conducting emergency drills, and so on.

①Status of Possession and Pervasion of Emergency Response Manuals
95% of members possess emergency response manuals.

②Status of Setting up of 24 Hours Communication Network
98% of members maintain 24 hours communication network.

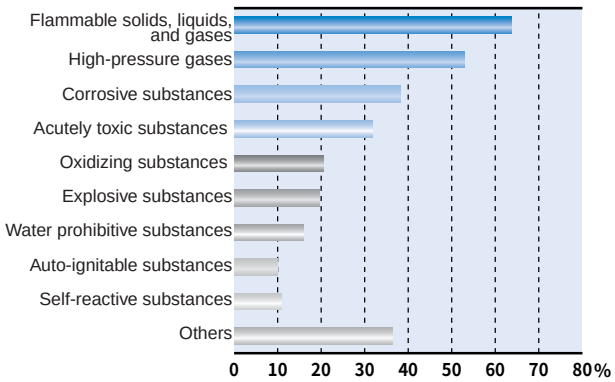
③Execution of Emergency Response Drills
87% of members have executed emergency response drills. Slightly below 80% companies have executed practical trainings.

a)Communication training	b)Theoretical training	c)Practical training
77.3%	30.7%	78.4%

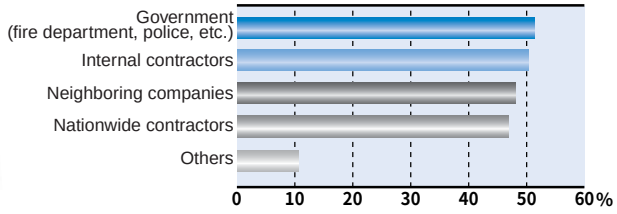
◆Joint Accident Response Services

Responding to emergency, 85% of members maintain joint accident response services.
Object substances are flammable solids/gases and high-pressure gases, and corrosive substances in the order named, and the counterparts that jointly respond to accidents are administration and internal contractors, neighboring companies in the order named.

Substances for which Joint Accident Response Services are provided



Counterparts Jointly Respond to Accidents

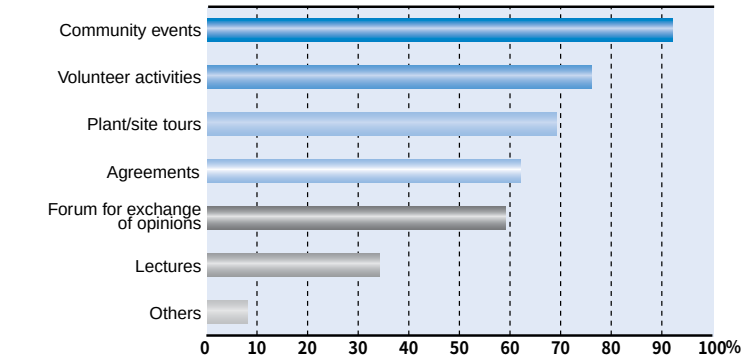


Responsible Care Initiatives of JRCC Members
〈Communication with the Community〉

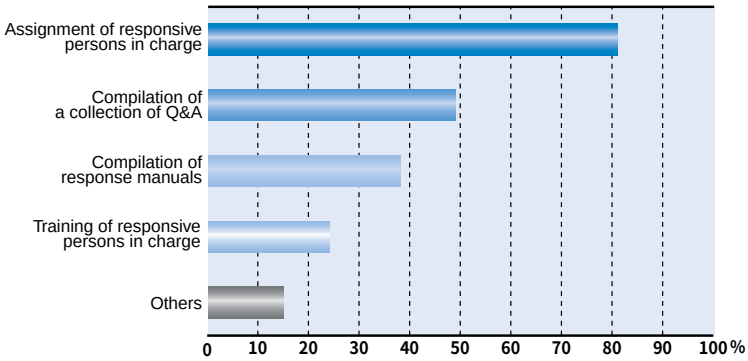
JRCC member companies recognize the importance of harmony with local communities and proactively and voluntarily take various initiatives to coexist with them by earning the trust of the communities.

Member companies have been striving to have a variety of communication with local communities by coming in contact with the communities through participation in local events, cooperation and providing facilities to local events, and volunteer activities for cleaning/beautification campaign; by exchanging or interchanging views and opinions at the place of forums on pollution prevention and environmental safety; and by letting the residents deepen understanding by means of organizing plant visits, giving chemistry classes to local elementary and junior high school students, and so forth.
In the meantime, PRTR data in fiscal 2001 were publicized in March 2003. Based on those publicized data, risk communication with the stakeholders will start hereafter. Member companies have made preparations for the communication such as assignment of responsive persons in charge and their training, compilation of response manuals and collections of Q&A.

Communication with the Community (multiple answers)



Risk Communication to PRTR Publicized Data (multiple answers)




Plant tour for local elementary and junior high school students


Cooperation in extracurricular studies of elementary school children


Experience studies of chemistry classes and chemical experiments


Synthetic firefighting training


A forum for exchange of opinions with local residents


Plant tour

Responsible Care Initiatives of JRCC

Direction of JRCC Members' Responsible Care Initiatives

Direction of items of recent activities by member companies is introduced here from their implementation plans and reports.

① Items Newly Challenged

Total abolition of substitute fluorocarbons, Establishment of communication on chemicals with customers, Introduction of Container Yellow Card, Opening environmental issues basic courses, Risk management response training, Mental health response, Internet distribution of MSDSs, Countermeasures against terrorism, etc.

② Items in which challenging Members has been Increasing

Verification by third party such as the JRCC, etc., Introduction and operation of OSHMS (OHSAS18001, etc.), Achievement of zero emission of industrial wastes, ISO authentication of group companies, etc.

Waste Combustion Facilities

As of December 1997, 77 of JRCC member companies were in possession of 558 waste combustion facilities, of which 61% were abolished or halted by March 2003.

Meanwhile, 22 of JRCC member companies have newly installed 30 combustion facilities in total. As at April 1, 2003, 241 combustion facilities are in operation.

Endocrine Disrupters Issue

69% of JRCC member companies answered that they were related, of which 57% members stated relation with their own products and 66% members stated relation with purchased products (multiple answers). As countermeasures, 46% of those member companies have been conducting survey and research tying up with related organizations. In the meantime, 61% of instances have stopped or planned to stop use of doubtful substances (multiple answers).

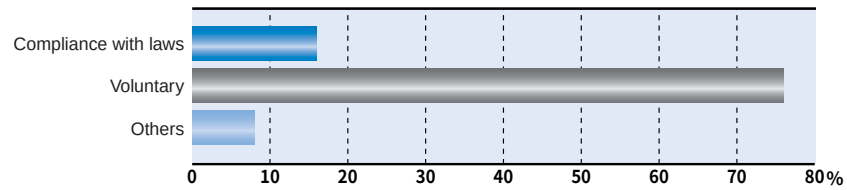
Soil and Underground Water Contamination

94 member companies answered, of which 74 companies, equivalent to 79%, have conducted investigation on soil and underground water contamination at 191 places in total.

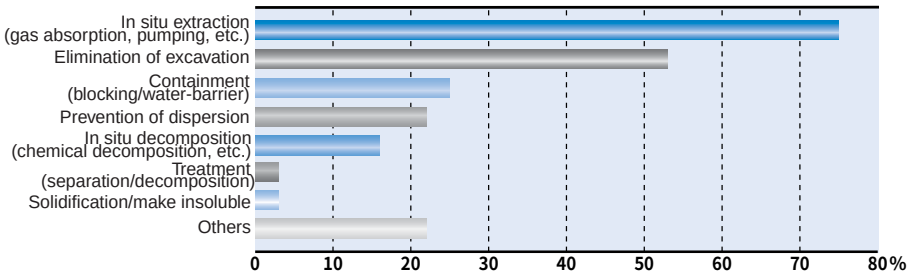
As motives for investigation, voluntary investigation occupies high 79% of the motives, and the proportion of 37% made investigation into the substances other than the legally specified substances..

Of the investigation at 191 places, at 57 places, equivalent to 30%, contamination exceeding the reference value was discovered, for which the countermeasures described in the right graph were taken.

Motives for Conducting Investigation



Anti-pollution Measures (multiple answers)



Members〈Surveys of JRCC Member Activities〉

On Responsible Care Reporting

JRCC member companies proactively strive to enhance communication with the public and local communities to gain further trust from them. As one of the tools, Responsible Care reports (or environmental reports) have been issued by individual member companies, disclosing their corporate environmental policies and activities.

① Number of companies issuing Responsible Care reports

Number of member companies issuing Responsible Care reports has been yearly increasing, and in fiscal 2002, 62 members issued Responsible Care reports.

② Number of companies issuing local edition Responsible Care reports

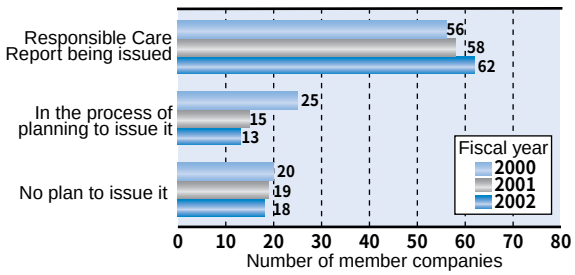
Number of member companies issuing local (site) reports is steadily increasing year after year. 21 members issued them in fiscal 2002. In addition, 27 members have prepared pages for local data (site data) in their company-wide edition.

③ Contents

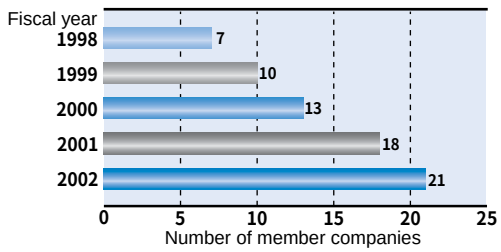
It is natural that many articles are about main items of Responsible Care reports viz. “Corporate policies and organization”, “Environmental preservation”, “Process safety and disaster prevention”, “Occupational health and safety”, and “Chemical and product safety”, but the fact that more than 80% of members mention the theme of “Community dialogue” indicates the characteristics of JRCC members to think highly of communication with the community.

Further, it can be mentioned as good results of Responsible Care activities that nearly half number (40%) of members have taken up newly added survey items “Negative information” and “Social responsibility”.

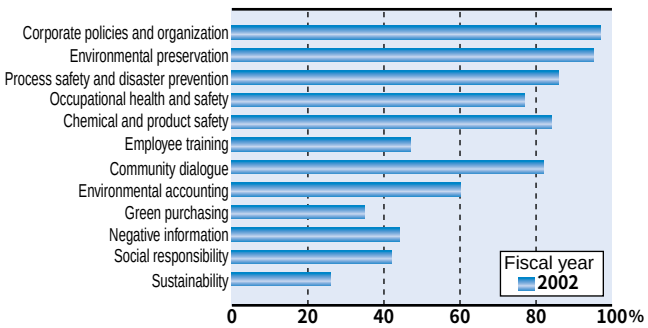
Issuance of Responsible Care Report



Issuance of Local Edition Responsible Care Report



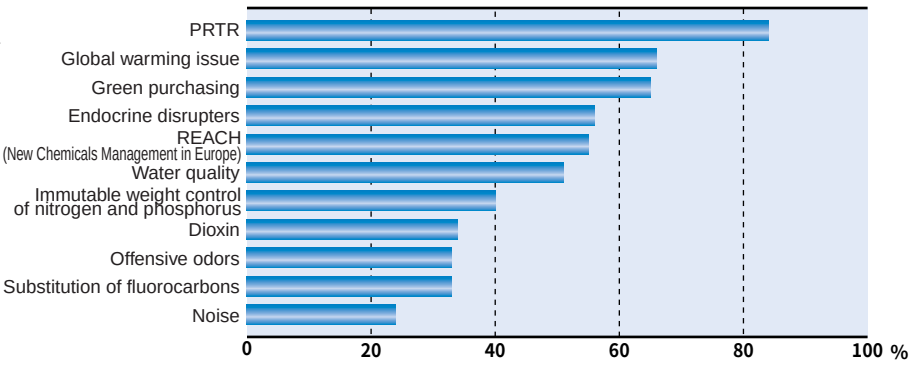
Report Contents



On Highly Interested (Affecting/Problematic) Items in Company's Business Operation

According to the multiple answers from 95 JRCC member companies, interested matters in common were PRTR first, followed by Global warming issue, Green purchasing, etc. as shown in the right graph.

Degrees of Interest in Business Operation



Responsible Care Initiatives of JRCC

Every year, member companies submit to the JRCC Responsible Care reports, along with plans for the upcoming year. Member companies conduct a self-assessment of their Responsible Care activities and management systems based on their internal audits.
In fiscal 2002 the JRCC revised the indicators of the internal audit, intending to enable JRCC members to make self-assessment in more detail and to continuously improve their activities. As a transitional period, assessments by conventional indicators and by new indicators co-existed in the self-assessment made in fiscal 2002, of which 56 companies made the self-assessment by conventional indicators and 37 companies made it by new indicators.

Result of Assessment by Conventional Indicators

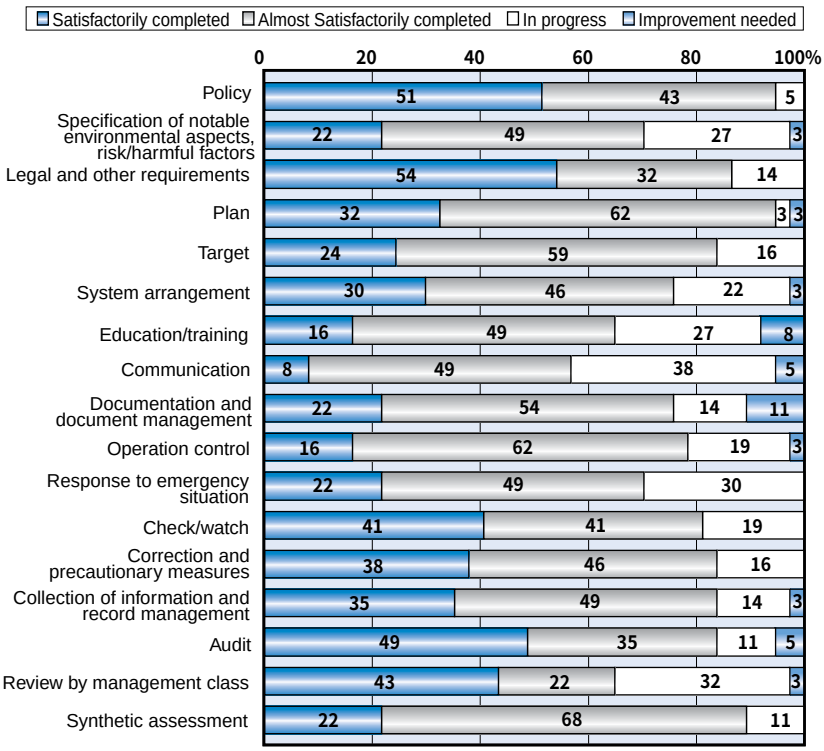
The results of 56 companies' assessment by conventional indicators were approximately the same as in the previous fiscal year per each item at the distribution of assessment points.

Self-assessment by New Indicators

New assessment indicators have been coordinated with the management system such as ISO14001, ISO9000, OHSAS18001, etc. which JRCC member companies have increasingly been introducing, and in addition, in order to prevent oversight of checking, repletion of check sheet has been intended.
The self-assessments were made based on a five-point system regarding 7 "Responsible Care Codes" of Management System, Environmental Preservation, Process Safety and Disaster Prevention, Occupational Health and Safety, Distribution Safety, Chemical and Products Safety, and Community Dialogue, which are implementation items of Responsible Care, and further as per items of policy, target, plan, check/watch, etc. It classifies over 4.5 points = satisfactorily completed, over 3.5 points and not more than 4.5 points=almost satisfactorily completed, over 2.5 points and not more than 3.5 points = in progress, and not more than 2.5 points = improvement needed.
The graphs below show the results of the self-assessments regarding 5 codes.

① Management System

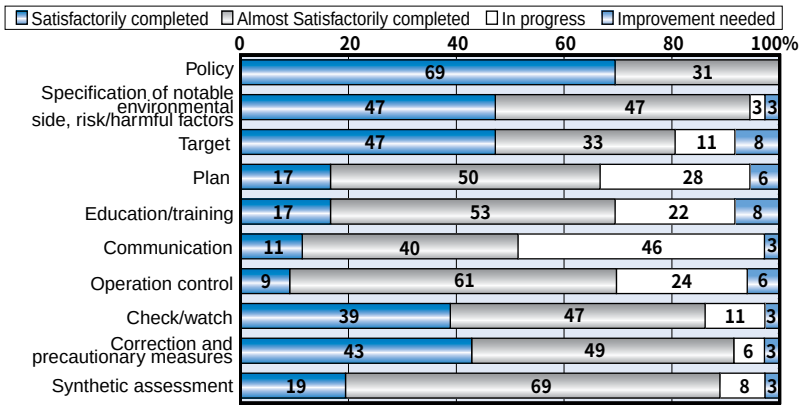
Introduction of management system such as ISO14001, ISO9000, andOHSAS18001 has been in progress, and repletion has been proceeding with the items of policy, specification of requirements, check/watch, etc. On the other hand, repletion of the items such as education/training, communication, etc. will be a problem to solve hereafter.



Members〈Member's Self-assessment〉

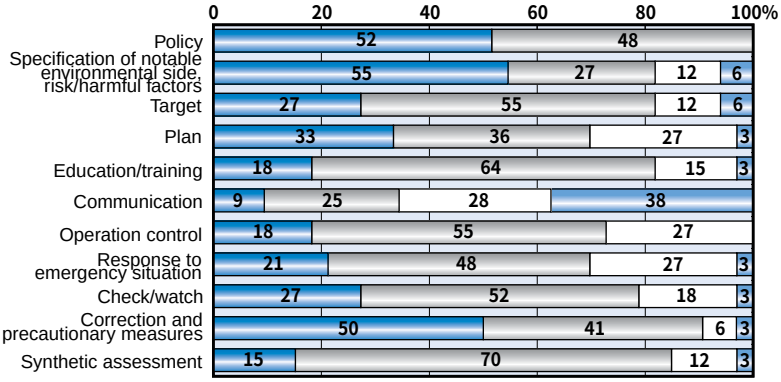
② Environmental Preservation

Introduction of management system such as ISO, etc. has been in progress, and repletion has been proceeding with the items of policy, specification of requirements, check/watch, etc. On the other hand, repletion of the items such as education/training, communication, etc. will be a problem to solve hereafter.



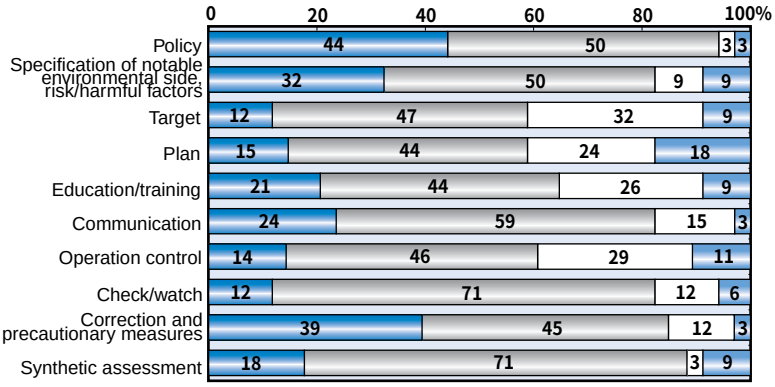
③Process Safety and Disaster Prevention

Efforts made up to now, overall repletion has proceeded. Repletion of communication, however, will be a problem to solve hereafter.



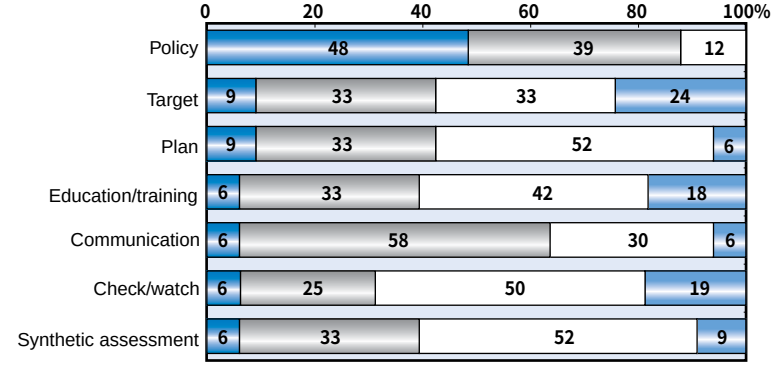
④ Chemical and Product Safety

According to the synthetic assessment, approximately 90% has been completed, but the contents appear to be dispersed to some degree. Target, Plan and Operation control will be necessary to be further arranged.



⑤ Dialogue with Communities

In view of the synthetic assessment, this code became the lowest assessment out of the 7 codes. It is considered that repletion of the activities of this code is to be required.



JRCC Activities
〈Safety Awards and Symposiums〉

To protect health and secure safety of working people is one of the important activities of Responsible Care. The JRCC, jointly with the JCIA, has made “safety awards” and has held “safety symposiums” based on case studies by winning companies since 2000.

[Safety Awards and Safety Symposiums]

A system was originally set up in 1977 by the JCIA, as part of efforts to encourage independent Process safety and disaster prevention as well as Occupational health and safety improvement at chemical companies after a spate of accidents around 1973 and 1974 in chemical industry complexes. Since that year, awards have been made annually to factories whose excellent safety records make them models for others. The May 2003 awards marked the 27th time since the contest had been held.
It is firmly considered that when a factory wins an award, there is a beneficial influence both on other plants within the company and on safety measures throughout the industry.

This year’s winners were:

- **Safety Award**
  Aichi Plants, Nippon Paint Co., Ltd.
- **Safety Effort Award**
  Chiba Plant, Toray Industries, Inc.
  Agricultural Chemicals Research Laboratory, Sumitomo Chemical Co., Ltd.
  Nobeoka LSI Plant, ASAHI KASEI MICROSYSTEMS Co., Ltd.
  Hyuga-Chemicals Plant, ASAHI KASEI CORPORATION
  Oita Plant, Oita Chemical Co., Ltd.

170 people including those who did not belong to the JRCC attended “Safety Symposium” held at Invention Assembly Hall June 19 (Thursday) 2002. They eagerly listened to detailed presentations on the winners’ safety activities and also to the panel discussion entitled “How to Continue Zero Accident”.

Followings are winners’ brief outlines and their safety records:

★ Aichi Plants, Nippon Paint Co., Ltd.

Aichi Plants is located in Takahama City, Aichi Prefecture, and commenced its production in 1970. It is a manufacturing plant with the products centering on paints for automobiles. It acquired ISO9001 certification in 1998, and ISO14001 in 1999, respectively. It employs 181 people and has continued zero accident for the last 28 years and some. This Plant was honored with Ministry of Labour and Welfare's The Third Class (5,920 thousand hours) Record Certificate in February 1995, and the JCIA’s Safety Effort Award in 1998, respectively.

★ Chiba Plant, Toray Industries, Inc

Chiba Plant is located in Ichihara City, Chiba Prefecture, the center area of Keiyoh (Tokyo-Chiba) Seaside Industrial Zone, and commenced its operation in 1970, manufacturing mainly ABS resin. It acquired ISO9001 certification in 1994, and ISO14001 in 2000. It employs 114 people

and has continued zero accident over 24 years. This plant was honored with Ministry of Labour and Welfare’s The Second Class (5,400 thousand hours) Record Certificate in February 1995.

★ Agricultural Chemicals Research Laboratory, Sumitomo Chemical Co., Ltd.

In 1968, Research Department, Agriculture Division and Research Department, Pharmaceutical Division moved from Osaka Plant to Takarazuka region, and thereafter through some changes, the present Agricultural Chemicals Research Laboratory was formed. Its major research fields are agrochemicals, domestic medicines for prevention of epidemics, high-performance fertilizers, and agri-bio. This laboratory has 212 employees, and has been continuing its zero accident record over 16 years. It also won the JCIA’ Safety Effort Award in 1997.

★Nobeoka LSI Plant, ASAHI KASEI MICROSYSTEMS Co., Ltd.

Nobeoka LSI Plant is located in Nobeoka City, Miyazaki Prefecture, and commenced its operation in 1993, producing mainly LSIs for vehicle communication equipment and for audio-video apparatus. It employs 437 with 31.9 years of age in average, consisting of many comparatively young people, and has continued its zero accident for 10 years and some since its start of operation.

★ Hyuga-Chemicals Plant, ASAHI KASEI CORPORATION

Hyuga Plant is located at Hosojima Seaside Industrial Zone in Hyuga City, Miyazaki Prefecture, and started its operation in 1975, at present producing mainly “Duranate” (non-yellowing polyisocyanate). It has 56 employees, and has continued to record zero accident for over 28 years since its start of operation.

★ Oita Plant, Oita Chemical Co., Ltd.

Oita Plant is located within Oita Petrochemical Complex in Oita City, Oita Prefecture. It started in 1972 as a plant of Nippon Kayaku Co., Ltd., then in 1983 Toagosei Co., Ltd. succeeded a complete set of the plant and opened Oita Plant, Oita Chemical Co., Ltd., which has been brought to the present. The plant has been manufacturing acryl acid and acrolein, has 40 employees, and has been continuing zero accident for over 19 years ever after its start of operation.

※ Both the details of presentations by each winner and the minutes of panel discussions appear in the “Document display” column of the JCIA’s home page.
http://www.nikkakyo.org/document_display_jp.php3?documentid=1001

JRCC Activities〈Dialogue with the Public〉

One of very important Responsible Care activities is to insure clear understanding of society through public disclosure of the results of activities and communication with society.
Each JRCC member company has been promoting dialogues with society for this object in view, and through JRCC's Dialogue Working Group, JRCC has organized dialogue meetings as mentioned below.
In addition, JRCC has been engaged in public relation activities such as issuance of the quarterly brochure to promote understanding of JRCC's activities.

[Community Dialogue]

In 13 districts throughout Japan, including the 9 major petrochemical complex districts, JRCC has organized " Community Dialogue Meetings" with the participation of the representatives of local municipalities as well as the residents of each community and has been continuing its efforts to pervade Responsible Care and activities of JRCC member companies' local business places.
In fiscal 2002, making the conversion to discussion-style forums and appropriate response to PRTR system as major themes, JRCC held the community dialogue meetings in 7 existing districts of Kashima, Chiba, Toyama/Takaoka, Osaka, Hyogo, Okayama, and Yamaguchi, and in 1 new district of Aichi. Bidirectional dialogues have been promoted there through the devices of panel discussions and exchange of opinions with the participants.
In Tokuyaka Complex district, Tokuyama City and enterprises in the city jointly held an explanatory meeting for local residents and local administration concerned persons on the subjects of administration's and enterprises' initiatives on Environmental preservation and Process safety and disaster prevention as well as the data regarding emission volume, etc. based on PRTR system.

[Dialogue Meetings]

The sixth dialogue meeting with "Consumers. Japan" was held in fiscal 2002. After report was made by JCIA Secretariat in terms of the Johannesburg Summit (World Summit for the Sustainable Development), an exchange of opinions was made freely, without designating a specific theme.
In answer to an opinion of " It is impossible to know everything, and it would be good enough if there should exist a person who could interpret things standing in-between," a participant from the Ministry of the Environment mentioned "Under study is a system of raising persons who can explain in a neutral position."
In January 2003, a JRCC Dialogue Working Group member

attended at the meeting held by Coop Kanagawa on "Chemical Substances in Our Living," and explained in a simple way about Chemical substances control, Endocrine disrupters, Agrochemicals, etc., and further exchanges of opinions were made.
In addition, JRCC continued in fiscal 2002 to organize in Tokyo (in September) and in Osaka (in December) the "Environmental dialogue and interaction" with the students who belonged to the "AIESEC Japan", a NPO corporation of economic/commercial sciences line students supporting overseas internships, which JRCC commenced in fiscal 2001. Furthermore, in November 2002, JRCC similarly held the "Environmental dialogue and interaction" with "IAESTE Japan" [the International Association for the Exchange of Students for Technical Experience, Japan], an International NGO supporting international internships for science, engineering, and agriculture line students, where active exchanges of opinions took place with the participation of 15 students.

[Public Relations Activities]

To have the activities and achievements of JRCC, its members and members' facilities as well as international trend of Responsible Care known widely to the general public including its members, JRCC publishes the quarterly JRCC News.
In addition, the JRCC homepage makes available an introduction of Responsible Care "Do you know Responsible Care?," "Responsible Care Reports," "JRCC News," "regarding Association," etc., and at "Information Pages" JRCC has been endeavoring to timely deliver the information of JRCC's activities.

http://www.nikkakyo.org/organizations/jrcc/index.html

JRCC Activities

〈Verification Program of Responsible Care Activities〉

The Responsible Care Verification which the JRCC started in April 2002 has given steady results. In addition, in April 2003 the JRCC formally started the verification of Responsible Care report.

The Status of Undertaking Verification

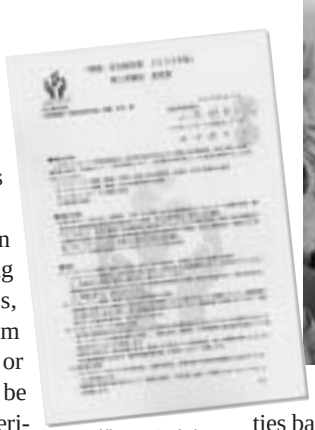
Up to now, the total number of 11 companies shown below undertook the verification.

Undertaken year and month	Name of the company	Kind of verification
April 2002	Tosoh Corp.	Responsible Care activities
April 2002	ASAHI KASEI CORP.	Responsible Care activities
September 2002	JSR Corp.	Responsible Care activities
December 2002	Asahi Denka Kogyo K.K.	Responsible Care activities
January 2003	Mitsubishi Chemical Corp.	Responsible Care activities
April 2003	Kaneka Corp.	Responsible Care activities
May 2003	ASAHI KASEI CORP.	Responsible Care report
May 2003	JSR Corp.	Responsible Care report
June 2003	Kao Corp.	Responsible Care report
July 2003	Mitsui Chemicals, Inc.	Responsible Care activities
September 2003	Nobeoka Branch, ASAHI KASEI CORP.	Responsible Care report(Site edition)

Evolving Responsible Care Verification

Scene of Verification

The Responsible Care Verification has evolved in response to needs of society and opinions from the Verification Advisory Committee, to make the most of the Responsible Care's feature of continuous improvement.



Verifier's Opinion

◇Verification conducting place may, upon approval of the verification undertaking company, be located at local facilities, as well as the head office. By this room for selection, inspection of necessary or supporting materials becomes able to be made on the spot, and more efficient verification can be pursued.

◇Depending on acceptance of the verification undertaking company, verification may include an interview to the management class. It is very meaningful to hear directly from the management class the recognition and the way of thinking concerning Responsible Care.

◇Verification of Responsible Care report has been modified to include site edition report as well as company-wide report. It is expected to promote publishing site edition Responsible Care report.

◇ As regards verification of activities, revision has been made to review the questionnaire and the assessment criteria in order to be able to make more accurate performance assessment. At present, the times of revisions amount to 7 times. For an example, verification of activities basically makes the facilities (plant, etc.) as its object, but depending on the assessment module, the activities of the facilities only cannot be assessed and it may require to include the head office or business divisions together; as a result, responding to such necessity, the questionnaire has been revised.

◇ As a direction toward the future, the JRCC considers it important to exert itself not only to enhance the capability of verifiers to enable to give useful advice to the undertaking companies for improving their Responsible Care activities as well as to make further improvement and repletion of the verification contents, but also to implement publication of the results of verification and fulfill the accountability of Responsible Care. The JRCC is looking forward to each member's active undertaking of the verification toward the future.

JRCC Activities
〈Communication among Members〉

The JRCC implements information exchanges, panel discussions and lectures by outside lecturers in Member Experience Exchange Meetings and Member Workshops among its members to improve the quality of Responsible Care activities.

[Member Experience Exchange Meetings]

Spearheaded by the Member Exchange Working Group, in fiscal 2002 JRCC held, in Tokyo and Okayama, Member Experience Exchange Meetings as forums for information sharing and members' good practice exchanges.

At the Tokyo meeting in August 2002, there were about 130 participants to the lecture on " The Way of Existence of Communications Requested for Chemical Industries" given by Mr. M. Nakamura, member of the Editorial Committee, Nihon Keizai Shimbun, Inc. The small group sessions had 7 topics, ①〜③ Risk Communication (District 1, District 2, and Customers), ④ Soil and Underground Water Contamination, ⑤ Wastes/Recycling ⑥ Occupational Safety/ Process Safety, and ⑦ Chemical Substance Control.

At the Okayama meeting in March 2003, about 50 people participated from JRCC member companies mainly in Sanyo district. Ms. Akemi Ori of Office Iris made a speech on "PRTR System and Risk Communication" and the participants joined in one of 4 group sessions to exchanged opinions each other. This was the first meeting held at provincial city other than Osaka, and interchanges of information and friendship between the member companies were deepened with facilities-concerned people centered at the Exchange Meeting and the social gathering after the Meeting.

[Member Workshops]

The JRCC continuously organized two Member Workshops after fiscal 2001 when the JRCC initiated the workshop to enhance Responsible Care activities level and share the current topics among JRCC members.

The first workshop was held on the theme of " Risk Communication in an Emergency" in August 2002 and attended by 105 JRCC members. Meiji Dairies Corporation, non-JRCC member, made a presentation, followed by presentations for case studies by 3 JRCC member companies of Toagosei Co., Ltd., Mitsubishi Rayon Co., Ltd., and Kao Corporation. Then, a panel discussion was organized to promote a deeper understanding about the themes.

The second workshop was held in April 2003 on the theme of " Green Procurement" with a large number of 140 participants. Chemicals user industries' Japan Electronics Information Technology Association (JEITA) and Toyota Motor Corporation were invited and their speakers delivered lectures on the way of thinking on Green Procurement as users and the status quo, followed by a panel discussion including JCIA's chairperson of the User Response Working Group and an exchange of opinion meeting.

The " Environmental Accounting Study Group" launched in 2002 has been developing vigorous activities aiming at drafting Guidelines of Environmental Accounting useful for chemical industries.

Member Experience Exchange Meeting (Tokyo)

Member Workshop

Member Experience Exchange Meeting (Okayama)

JRCC Activities〈International〉

Responsible Care Initiatives have been promoted throughout the world under the auspices of the Responsible Care Leadership Group (RCLG) of the International Council of Chemical Associations (ICCA). At the Johannesburg meeting of the RCLG in 2002, the admission of Venezuela was approved, making the total membership of 47 countries. In the Asia-Pacific region twelve countries are members. Recognized for its advanced level of Responsible Care implementation, Japan is expected to take on a leadership role.
Under the circumstances that Responsible Care has thus been developed globally, international activities have been pursued under the auspices of the International Working Group of the JRCC.

JRCC's Responsible Care Support to Asia

[Support in the Philippines]

The JRCC started in 2001 to support Responsible Care activities of Asian countries by Green Aid Plan (GAP) of Japanese Ministry of Economy, Trade and Industry.
In succession to the support in Thailand in 2001 and 2002, Responsible Care support was implemented in the Philippines in 2002. This support was made by the request of the Philippines Chemical Industry Association, and activity status survey and its assessment were made for two weeks.
On the first day an introduction of Responsible Care in Japan and an explanation of verification by the JRCC were made in seminar style gathering multiple people.
From the second day onward, the mission visited 6 companies in different locations, and survey as well as guidance at site were conducted. Guidance was provided by Q&A based on prior distributed checklist, and comments and advice were given to the responses.
On the last day, report on the results of visits was delivered in the style of seminar, and the meeting was closed in the form of workshop on the method of use of self dianosis table by the participants. This support is scheduled to be made in succession.

[Support for Responsible Care Activities in Vietnam]

JRCC held a seminar on Responsible Care at the Vietnam Ministry of Industry in Hanoi on 28th and 29th of January 2003. This was held by the request for cooperation from Vietnam Ministry of Industry to Japanese Ministry of Economy, Trade and Industry and was attended by approximately 50 people centering government officials.
On the first day, an introduction of concrete activities of Responsible Care and an explanation of international society's movement on chemical substance management were made by Japan, and current status recognition concerning Responsible Care and certain expectation for it were shown by Vietnam.
On the second day, an outline of Responsible Care was lectured and workshops were organized. At the workshops understanding was deepened through discussions by groups of small number of people.
In Vietnam there does not yet exist in fact any modern chemical industry, and this seminar may be mentioned to be preparation taking fostering the industry in sight.

[Cooperation in Environmental Preservation Training in ASEAN]

Upon request of Japanese Ministry of Economy, Trade and Industry, the JRCC cooperated in the captioned training organized by the Association of Overseas Technical Staff (AOTS) (October 2002). Trainees consisted of 17 persons from 8 countries, who were engaged in the chemical industry and government officials in charge of the environment and industrial policy.
Lecturers from ASAHI KASEI CORPORATION, Mitsubishi Chemical Corporation, Kyowa Hakko Kogyo Co., Ltd. and Nippon Paint Co., Ltd. made presentations of selected cases. Plant tours were made by cooperation of Hino Plant of Konica Corporation and Musashi Plant of Sekisui Chemical Co., Ltd.

[Cooperation in "Environmental Management Technology Training Course in the Chemical Industry" Sponsored by Japan International Cooperation Association (JICA)]

In July 2003, JRCC and JCIA (Japan Chemical Industry Association) dispatched lecturers to International Center for Environmental Technology Transfer (ICETT, trustee). 9 trainees from 7 countries (Indonesia, Cuba, Thailand, Bangladesh, Philippines, Brazil, and Malaysia) participated

in this course. The program extended over a wide area from technology trend in the chemical industry in Japan, state-of-the-art environmental management technology to Responsible Care, aiming to enable the participants to immediately reflect on arousing the chemical industry and the environmental preservation in their own countries.
The contents of the lectures JRCC and JCIA made were as follows:

- Responsible Care
- Risk communications
- Enforcement of PRTR law and initiative of the chemical industry
- Movement in the international society on chemical substance control
- Risk assessment and most appropriate applicable technology for the reduction of chemical substances

Followings are the companies which lent cooperation for visits, etc.:

- Sekisui Plastics Co., Ltd.
- Maruzen Petrochemical Co., Ltd.
- Kao Corporation
- JSR Corporation
- Tosoh Corporation
- Ishihara Sangyo Kaisha Ltd.

[JRCC's Participation in the Symposium Held in Thailand]

At the APEC chemical dialogue, REACH (Registration Evaluation and Authorization of Chemicals) and GHS (Globally Harmonized System; an international harmony regarding categorization and marking of chemicals) were recognized as current important issues in the Asian region. In response to this, Thai Industry Association organized a panel discussion on GHS at its annual general assembly meeting. JRCC was invited as a panelist together with Director of Safety Technology Center of Thai Ministry of Industry, and an expert at Bayer Asia Pacific.
There existed not much information on GHS in Thailand, but interest (or may be called as sense of crisis) was very large and questions continued over the scheduled time.

World Trend: Activities of ICCA

[Johannesburg World Summit]

Environment Summit held in Johannesburg, South Africa in August 2002 had participants of more than 20,000 (including 104 leaders) from 191 countries.
During the period, a ceremony of awarding honors of World Summit Business Awards for Sustainable Development Partnerships was held, where Responsible Care also won the award.

[Report of RCLG Johannesburg Conference]

In August 2002, RCLG conference was held in Johannesburg and was attended by 27 people from 18 countries/regions.
Brief outline of this conference is as follows:

- Venezuela's joining was approved and the number of the member nations has become 47.
- The following four points were taken up as important subjects:
  ① Promotion of joining the Industry Association where the facilities of multi-national enterprises are located.
  ② Restructuring and worldwide development of Responsible Care activities.
  ③ Promotion of the logo mark registration.
  ④ Review of Working Group activities under RCLG.

[World Review of Responsible Care]

Responsible Care has made the backbone to support the chemical industry's activities since its start in 1985.
ICCA has announced to review the activities for the purpose of re-activation and strengthening of Responsible Care. This review is scheduled to be implemented in cooperation between CEOs of global chemical industries and ICCA. One of the targets is that all the countries that implement Responsible Care activities make up more matching initiatives, which are expected to be completed by 2004.
Definite items under review are:

1) Member support
2) Harmonization and Consistency
3) Verification
4) Value in trade and sustainable development, etc.

and Director General of Japan Chemical Industry Association also has been taken part in the reviewing work as a member.

Glossary of Terms

- **ICCA** (International Council of Chemical Associations)
  An organization of the world's chemical industry groups, which, as of its establishment in 1990, has included the Japan Chemical Industry Association

- **RCLG** (Responsible Care Leadership Group)
  An organization of promoting Responsible Care of ICCA. It consists of chemical industry association of each country. Number of joined countries is 47 at present.

- **JCIA** (Japan Chemical Industry Association)

- **JRCC** (Japan Responsible Care Council)
  An organization established within JCIA in 1995 for the promotion of Responsible Care in Japan

- **APRC** (Asia Pacific Responsible Care)
  8th APRC conference was held in Korea in November 2003.

- **PRTR** (Pollutant Release and Transfer Register)
  A regulatory system which requires reporting of emission volumes of chemical substances into the air, water and soil and transferred volumes of wastes. Data compiled to the government bodies are disclosed to the public.

- **Zero Emission**
  An environmental preservation activity that seeks to completely eliminate waste products and emissions

- **Greenhouse Gases**
  As cause for global warming, six gases have been determined. They are Carbon dioxide, Methane, Nitrogen monoxide, Hydrofluorocarbons (HFC), Perfluorocarbons (PFC), and Sulfur hexafluoride (SF_6).

- **NOx** (Nitrogen Oxides)
  Toxic substances contributing to air pollution; calculated in units of NOx.

- **SOx** (Sulfur Oxides)
  Toxic substances contributing to air pollution, consisting major component of Sulfur Dioxide (So_2), with trace amount of Sulfur Trioxide (SO_3), and are noted as SOx.

- **OSHMS** (Occupational Safety and Health Management System)
  A management system that establishes organization, responsibility, routine, procedure, process and managerial resources for reducing latent risks to occupational safety and health on a continual basis

- **MSDS** (Material Safety Data Sheet)
  A document that describes the health, safety and environmental hazards of a material and provides information on how the material can be safely handled, used and disposed

- **Green Procurement**
  The assigning of priority to items that take environmental concerns into consideration or have little impact on the environment in the purchasing and procurement of products and materials

- **Product Stewardship**
  A process to make health, safety and environmental protection an integral part of designing, manufacturing, marketing, distributing, using, recycling and disposal of products

- **Dioxins**
  General designation for the Polychlorinated Dibenzo-Para-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) emitted from a wide range of sources, including waste incinerators and electric furnaces used in steel making. There are 75 different types of PCDDs and 135 different types of PCDFs. 2,3,7,8- chlorine substituted PCDDs are considered to be the most toxic.

- **PDCA Cycle**
  PDCA is an abbreviation for Plan, Do, Check and Act, which is a basic way of thinking in management to make continuous improvements. It is a continuous process for improvement by a cycle of making a plan, carrying out the plan, checking and analyzing the results, taking actions to improve defects, and making a new plan for the next cycle.

- **REACH** (Registration Evaluation and Authorization of Chemicals)
  Chemical substances control studied in Europe.

- **GHS** (Globally Harmonized System)
  World harmonized system for classification and marking of chemical substances.

JRCC Members List

Total 114 companies in alphabetical order as of October 2003

Air Products Japan, Inc.
Akzo Nobel K.K.
Asahi Denka Kogyo K.K.
Asahi Glass Co., Ltd.
ASAHI KASEI CORPORATION
BASF Japan Ltd.
Bayer Ltd.
Central Glass Co., Ltd.
ChevronTexaco Japan Ltd.
Chisso Corporation
Chugoku Kayaku Co., Ltd.
Ciba Specialty Chemicals K.K.
Clariant (Japan) K.K.
Dai Nippon Toryo Co., Ltd.
Daicel Chemical Industries, Ltd.
DAIHACHI CHEMICAL INDUSTRY CO., LTD.
Dai-ichi Kogyo Seiyaku Co., Ltd.
Daikin Industries, Ltd.
Dainichiseika Color & Chemicals Mfg. Co., Ltd.
Dainippon Ink & Chemicals, Incorporated
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.
Idemitsu Petrochemical Co., Ltd.
Ishihara Sangyo Kaisha Ltd.
Japan Acrylic Chemical Co., Ltd.
Japan Carlit Co., Ltd.
Japan Elastomer Co., Ltd.
JSR Corporation
Kanebo GOHSEN, LTD.
Kaneka Corporation
Kansai Paint Co., Ltd.
Kanto Denka Kogyo Co., Ltd.
Kao Corporation
Koei Chemical Company, Limited
Konica Minolta Chemical Co., Ltd.
Konica Minolta Holdings, Inc.
Kuraray Co., Ltd.
Kureha Chemical Industry Co., Ltd.
KUREHA PLASTICS CO., LTD
Kyowa Hakko Kogyo Co., Ltd.
Lion Corporation
Maruzen Petrochemical Co., Ltd.
Mitsubishi Chemical Corporation
Mitsubishi Gas Chemical Company, Inc.
Mitsubishi Pharma Corporation
Mitsubishi Rayon Co., Ltd.
Mitsui Chemicals, 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 Co., Ltd.
Nippon Polyurethane Industry Co., Ltd.
Nippon Shokubai Co., Ltd.
Nippon Soda Co., Ltd.
Nippon Steel Chemical Co., Ltd.
Nippon Unicar Company Limited
Nippon Zeon Co., Ltd.
Nissan Chemical Industries, Ltd.
NOF Corporation
Ozeki Chemical Industry Co., Ltd.
Polyplastics Co., Ltd.
Rohm and Haas Japan K.K.
Sakai Chemical Industry Co., Ltd.
Sanko Co., Ltd.
Sanyo Chemical Industries, Ltd.
Sekisui Chemical Co., Ltd.
Sekisui Plastics Co., Ltd.
Shell Chemicals Japan Ltd.
Shikoku Chemicals Corp.
Shin-Etsu Chemical Co., Ltd.
Showa Denko K.K.
Showa Denko Elastomers K.K.
Showa Highpolymer Co., Ltd.
Showa Tansan Co., Ltd.
Sika Japan Ltd.
Solutia Japan Limited
Sumika Bayer Urethane Co., Ltd.
Sumitomo Bakelite Co., Ltd.
Sumitomo Chemicals Co., Ltd.
Sumitomo Dow Limited
Sumitomo Seika Chemicals Co., Ltd.
SunAllomer. Ltd.
Takeda Chemical Industries, Ltd.
Taoka Chemical Company Limited
Tayca Corporation
Techno Polymer Co., Ltd.
Teijin Limited
The Inctec Inc.
The Nippon Synthetic Chemical Industry Co., Ltd.
Toagosei Co., Ltd.
Tokuyama Corporation
Tonen Chemical Corp.
Toray Industries, Inc.
Tosoh Corporation
Toyo Ink Mfg. Co., Ltd.
Toyo Kasei Kogyo Co., Ltd.
Tsurumi Soda Co., Ltd.
Ube Industries, Ltd.
UMG ABS
Wilbur-Ellis Co., (Japan) Ltd.

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