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

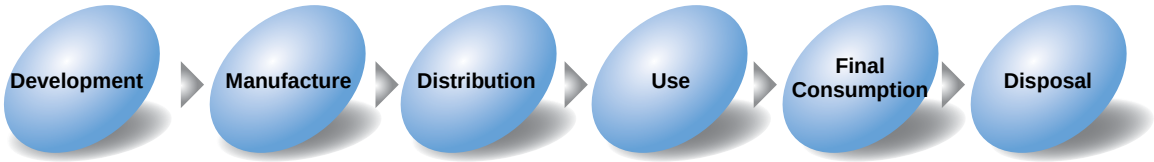
Responsible Care Report 2004

The Japan Responsible Care Council

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 2004). 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 2004, the JRCC comprised 110 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, JRCC, and JRCC member companies.

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Responsible Care Implementation Items

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).

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, member experience exchanges, international affairs, verification, and PRTR (Pollutant Release and Transfer Register) response.

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

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Message from JRCC Chairman

Mitsuo Ohashi
Chairman
Japan Responsible Care Council

This Century which is said to be the era of the globe is the era when each one of us is required to sincerely think how sustainably mankind can develop in harmony with the global environment, carry out the program, and continue to surely obtain good results.

The chemical industry has provided affluence and dreams through its products and technology to people's living. The industry is also required to continuously provide such products and technology as sought for by customers in the future, and at the same time to make every effort to minimize potential risks of giving harmful influence on health and the environment.

Under the circumstances, it is indispensable for a chemical enterprise as a member of the society existing on the globe to contribute to the environment and at the same time to certainly promote Responsible Care in order to steadily carry out the responsibilities which an enterprise has to fulfill to the society.

Japan Responsible Care Council has met a critical juncture of 10th year after its establishment in April 1995. We take this year as a summary of its up-to-date activities, and further we conceive it as a turning point to head for a new target exactly corresponding to the current problems.

Particularly, followings are some of the recent concrete tasks:
1) Response to globalization
・Response to global environmental preservation such as global warming countermeasures
・Response to the new regulations (REACH) on EU chemicals and their applied products
2) Response to providing safety information to overall supply chains
3) Further improvement of transparency
4) Continuous improvement of performance
This Responsible Care Report 2004 describes on these problems, and making further review by self-assessment and from the medium term viewpoint as well as listening to your voices given through disclosure to the public, we will take the initiative for more advanced Responsible Care activities and for its further enlargement in the future.

I sincerely hope that the JRCC Responsible Care Report 2004 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 2004

Mitsuo Ohashi

Board Members of Japan Responsible Care Council

Chairman	**Mitsuo Ohashi**	Chairman, Japan Chemical Industry Association, President, Showa Denko K.K.
Vice Chairman	**Tadasu Tachi**	Counselor, Kaneka Corporation
Vice Chairman	**Shigetaka Komori**	President, 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

My dream is to advance "Scientific technology for the sustainable development" under international cooperation.

At present all industrial fields have been vigorously developing aiming at maintenance and recovery of the environment. But, I believe, a further stepping forward from this position is essential. It exists behind the environmental recovery technology of the individual industry. It is required to depict a larger, new technology system, to newly look out for the technology feasible by such technology system, and to plan to realize those feasible technologies. The said technology system is different from the existing one. For example, it includes a rise in functional density, minimization of material diffusion, expansion of natural environment, promotion of biological diversity, etc. As a matter of fact, there currently exists individual technology development directed at those, but there does not exist any methodology to discuss those subjects generally as systematic technology or science.

To know this methodology is, in my thought, indispensable for mankind as a whole to make necessary technology development aiming at expelling poverty on earth without casting a burden on the global environment.

As to perform an important role for the sustainable development, I conceive that the industry has to contrive the new systems different from conventional ones all in the science and 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. 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 "Sustainable development" in the realistic chemical industry cannot be attained.

H Yoshikawa

Members of Japan Responsible Care Council Advisory Board

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

JRCC Activity Plan and Its Implementation Status

The JRCC has met 10th year since it 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 2003 and its implementation status, and also its plan for the fiscal year of 2004:

Responsible Care Policy

①Increase the transparency of Responsible Care activities and encourage information disclosure and communication with the public
② Pervasion of Responsible Care
③Play a leadership role in Asian nations
④Improve its performances continuously

	Plan for Fiscal 2003	Implementation Status in Fiscal 2003	Plan for Fiscal 2004
Information Disclosure	• Draft and publish reports • Promote and support members to issue environmental reports	• Drafted reports • Held an annual report meeting in Osaka and in Tokyo • 63 members in total issued environmental reports	• Draft and publish reports • Support members to issue environmental reports; increase issuing members
Communication	• Continue and enrich existing dialogue forums (communities, citizens) • Expand targets of dialogues • Strengthen foundations of dialogues	• Held dialogue-forums at 6 locations including existing and new locations. • Held dialogue forums with student organizations and consumer organizations 4 times in total • Held first dialogue forum with a Kansai consumer organization	• Continue existing dialogue forums (communities, citizens) • Expand dialogue partners and dialogue communities • Utilize dialogue support tools; enrich dialogues
Promote Responsible Care activities	• Expand membership by 10 companies • Support promoting Responsible Care activities by members' affiliates'	• No new members • Issued environmental accounting guideline; articles on environmental accounting increased in member's environmental report	• Implement the group registration system in full scale, and support Responsible Care activities by member's affiliates
International Activities	• Support Asian countries • Positively participate in the ICCA/RCLG activities • Participate in APRCC conference in Korea	• Implemented support for Asia such as Philippines • At APRCC Korea conference: member participants 17, presentation 4	• Support Asian countries • Positively participate in the ICCA/RCLG activities • Support and continue APRO
Chemical & product safety	• Implement providing appropriate information and communication	• Continued dialogue with the electrical machinery and automobile industries on the subject of green procurement	• Implement providing appropriate information and communication
Support Responsible Care activities of members	• Hold experience exchange meetings and workshops meetings for members	• Held 2 exchange meetings on the theme of "Learning on failure" • Held 2 workshop meetings on the theme of environmental accounting	• Hold experience exchange meetings and workshops meetings for members • Urge participation of outsider companies
Responsible Care verification	• More than 15 companies to undertake the verification	• Implemented verification of 11 companies	• Promote the spread of verification to members • Verification undertaking raises reliability of Responsible Care activities

About the Responsible Care Report 2004

This report is an overview and summary of the JRCC's activities as a whole, while focusing primarily on the individual activities of 110 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 2003 JRCC activities, including surveys carried out among JRCC member companies. This is the JRCC's ninth publication since fiscal 1995.

Topics

Industrial waste Final waste treatment volumes steadily reduced 79% reduction compared with fiscal 1990
The chemical industry set the goal of "Reducing final waste treatment volumes by approximately 80% compared to fiscal 1990 levels in fiscal 2010." JRCC member companies made their reduction plan of higher target, and attained in fiscal 2003 79% reduction compared with fiscal 1990. → P9

Unit energy consumption the goal in fiscal 2010 already attained 88% of that in fiscal 1990
The chemical industry set the goal to reduce unit energy consumption to "90% of that in fiscal 1990 by fiscal 2010." Member companies' actual results in fiscal 2003 turned out to be 88%, which attained the goal by moving up the schedule. → P10

Aggregate volume of release of 354 substances specified by Law Concerning Reporting, etc. of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (the PRTR Law) 47% reduction compared with fiscal 2000
Listed is transition at member companies of emission volumes and externally treated waste volumes since fiscal 2000. Of 12 harmful air pollution substances under voluntary reduction of emission volumes, 10 substances cleared the reduction goal in fiscal 2003. → P12

Occupational health and safety Frequency rate, Severity rate tends to increase since fiscal 2000
The frequency rate shows largely below that of the whole manufacturing industry, but tends to increase since fiscal 2000. The severity rate similarly has been on the upward trend since fiscal 2000. Member companies have been coping with this issue by the introduction of Occupational Safety and Health Management System (OSHMS), etc.. → P17

REACH responsive council established
Information was classified and grasped in order to respond to the EU's new chemical substances control in Europe (REACH). Afterward, the JCIA established the REACH responsive council in September 2004, which has been studying its countermeasures. → P18

Initiative on HPV Assessments of 236 substances completed
ICCA, as part of its Responsible Care activities, set the goal to conduct assessments of 1000 substances by the end of year 2004, in which the JCIA has positively participated as its voluntary activity. Most recent status is that, as of July 2004 data acquisition and implementation of assessments of 905 substances were determined, of which assessments of 236 substances were completed. Japan has conducted assessments of 44 substances of the 236 substances, which have won high appreciation from overseas. → P18
※ HPV: a project to require acquisition of safety data and implementation of assessment regarding the existing chemical substance of which annual production volume per country amounts to not less than 1000 tons.

A pamphlet working up an outline of research on the LRI completed
"LRI an outline of research gist" working up an outline of research made up to date was issued. → P18
※ LRI: long-term research on the effects of chemical substances on human health and the environment.

"Environmental Accounting Guideline for Chemical Enterprises" made up
The society for the study of environmental accounting, which started at the opportunity of JRCC's Member Experience Exchange Meeting, made up an environmental accounting guideline for chemical enterprises, held Member Workshop and endeavored to pervade it. → P21

Member's self-assessment 7 codes stated
This year, member's self-assessment based on seven "Responsible Care Codes" is carried on this report. → P22

Responsible Care verification the total number of 25 companies undertook
The number of the companies which undertook the Responsible Care Verification by fiscal 2003 amounted to 16 in total. As of October, 2004, the number amounted to 25 in total. This report describes the verification's up-to-date progress and future prospect as well as the verification's examples and their reactions. → P30

Environmental Preservation (Reduction

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 of industrial waste in Japan total amounted to 4.3 years, which shows a gradual increase for these several years owing to decrease in final disposal volume. However, it should be invariably important hereafter the same as before to further proceed with reducing industrial waste for the purpose of establishing a sound material-cycle society as emitters.

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 Waste Generation

Reduction of Waste Generation Volumes

Generated volumes of industrial waste in fiscal 2003 represented approximately 18% decline compared to the fiscal 1990, and approximately 0.7% decline compared to the fiscal 2002 volumes generated. The results have been steadily improved.

JRCC member companies' collective plans target a reduction of 18% in fiscal 2010 compared with waste generation volumes in fiscal 1990.

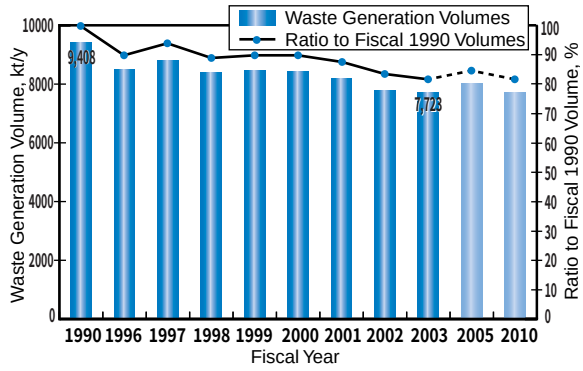
As reduction at generating sources of waste, a detailed review of manufacturing processes and improvement in facilities have been implemented. Examples of concrete measures are reduction of waste containers by reuse of raw material containers, volume reduction by condensation of waste liquid, and reduction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

Effective Resource Usage Rates

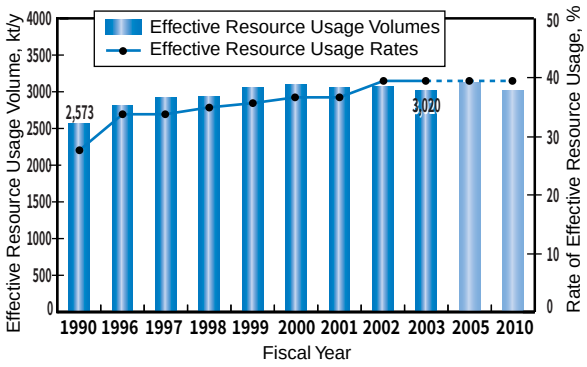
The rate of effective resource usage (ratio of effective use volumes to generated waste volumes) in fiscal 1990 was 27%. In fiscal 2003, this rate was raised to 39%, and reached the rate planned for fiscal 2010.

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

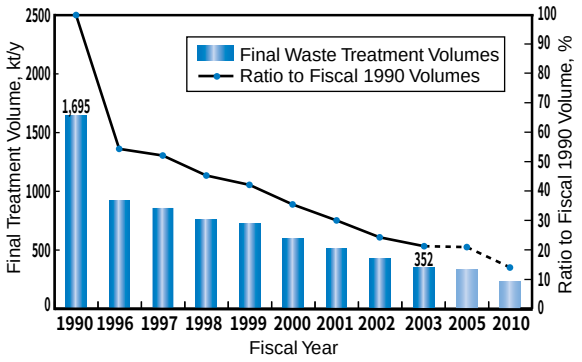


# of Industrial Waste)

Final Waste Treatment Volume

The volume of final waste treatment for fiscal 2003 was approximately 350,000 tons which represented 79% 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 81 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



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 sludge, etc. 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.

Case Studies of Each JRCC Member Company's Efforts

Asahi Kasei Fibers Corporation This company, making chemical recycling plant for effectively utilizing not-up-to-specification yarn, etc. as a basis, established chemical recycling technology of polyester products. It manufactures polyester polymers and fibers from the raw materials produced from PET bottles, etc.. At this recycling plant, as the reactive residue generated in the recycling process can be effectively utilized as fuel for power generation and for cement materials, no waste is generated at all. Also, the company has taken initiative in chemical recycling of uniforms of polyester products in cooperation with apparel companies.

Asahi Glass Co., Ltd. This company succeeded in putting recycling technology of fluorocarbon resin to practical use for the first time in the world and has been operating an analyzing/recycling plant. Fluorocarbon resin, which is used as covering material for heat resistant electric wire, semi-conductor manufacturing material, and electronics parts, as the handling of gas generated at the time of heat decomposition being difficult, used to be considered extremely difficult for recycling use and those not reclaimable have been disposed as industrial waste. This company, from the viewpoint of responsibility as a fluorocarbon maker, studied recycling technology of post-use fluorocarbon resin, and as a result of success in the development of material for analyzing equipment, successfully put the technology to practical use.

Showa Denko K.K. This company has been practicing chemical recycling by gasifying collected plastics. Industrial waste including general waste plastics-made container packaging is crashed, molded, gasified, and utilized as synthesis gas for the production of ammonia, and chemical products such as liquefied ammonia are produced. In addition, impurity contained in the collected waste is effectively used as variable metals or slugs, and therefore a complete recycling without discharging further waste can be accomplished.

Environmental Preservation (Energy Saving,

Energy-Saving

Chemical Industry's Target Achieved

According to the energy statistics in fiscal 2000, the chemical industry accounted for approximately 8% in the whole of Japan in energy consumption. The JCIA, based on the Keidanren's Voluntary Action Plan on the Environment, set up in 1996 the target to reduce unit energy consumption to 90% of that in fiscal 1990 by fiscal 2010. The graph on the right is based on data collected from 80 JRCC member companies. Unit energy consumption has been improving gradually year by year since fiscal 1990. Unit energy consumption in fiscal 2003 compared with fiscal 2002 improved by 2.8 points as a result of almost leveled off energy consumption and increment in production volume (Production index increased by 4 points), and resulted in 88% compared with fiscal 1990, thus the goal in fiscal 2010 could be achieved moving forwardly.

CO_2 Emission Volume

Although the production index in fiscal 2003 increased by 23% compared with fiscal 1990, thanks to the improvement in unit energy consumption, CO_2 emission volumes staid at 10% increase.

$$\text{Unit energy consumption} = \frac{\text{Energy required for manufacturing}}{\text{Production volume}}$$

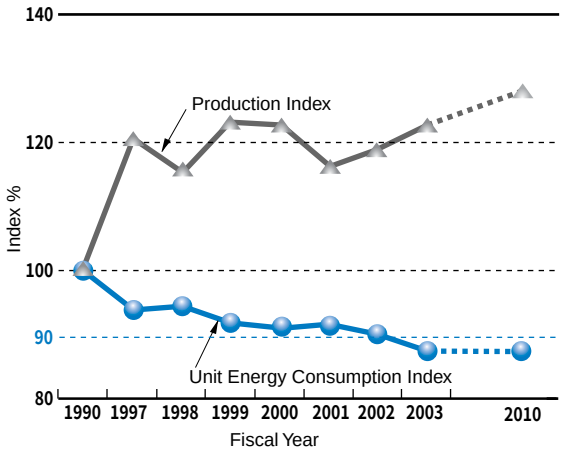
＜Factors Analysis of CO_2 Emission Volume Increase＞

Its main factors can be analyzed as below.
Inside ( ) containing data in fiscal 2002, the value by the save energy efforts by JRCC members increased.

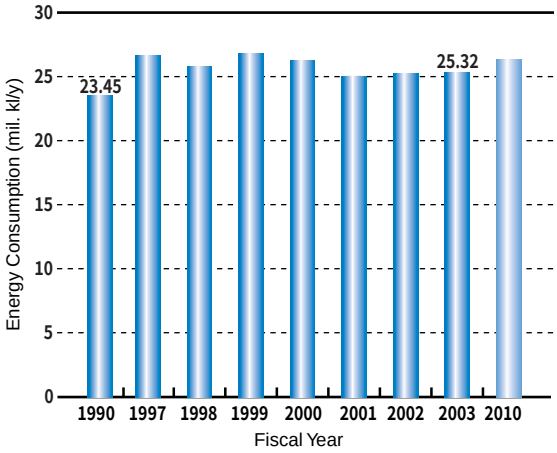
Increase by expansion of production	19.8%	(19.0%)
Save energy efforts by JRCC members	-10.4%	(-8.8%)
Improvement by purchased power unit	0.7%	(-0.3%)
Change in CO_2 emission volume	10.1%	(9.9%)

(Reference) It was decided at the COP3 conference (the 3rd Session of the Conference of Parties to the UN Framework Convention on Climate Change) in 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, and Amended Law Concerning the Promotion of the Measures to Cope with Global Warming was promulgated and enforced in May, commencing practical move toward attaining the goal set by the Kyoto Protocol.
As a challenge at the industrial sector, Further improvement in energy efficiency in manufacturing processes, Contribution of reduction to the civil and transportation sectors through the activities for reducing emissions, etc. in the whole product life cycle, and Clarification of the tasks to tackle at each individual company and its initiative in action plan including environmental education to its employees are sought for.

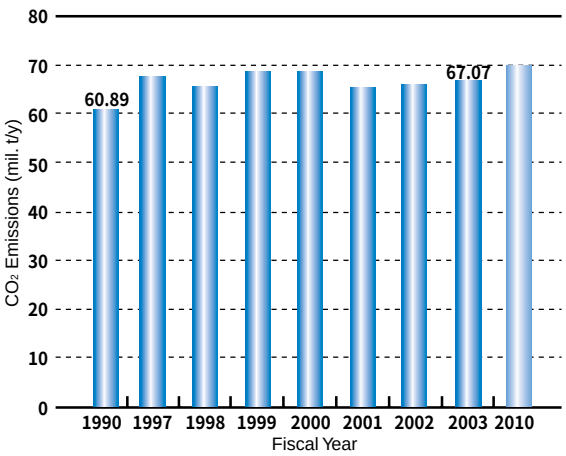
Trends and Forecasts in Unit Energy Consumption Index and Production Index



Energy Consumption (as crude oil)



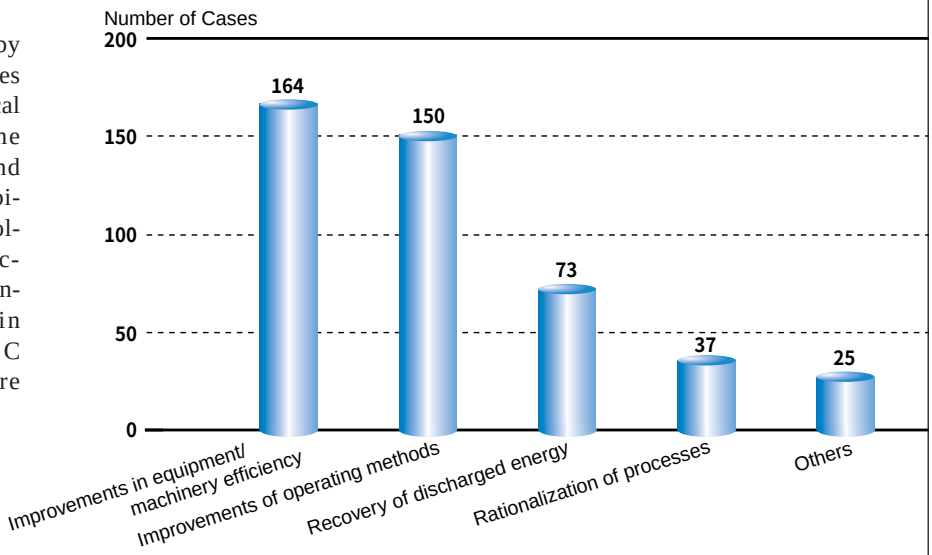
CO_2 Emissions



Global Warming Countermeasures)

Energy-Saving Achievements

Actual measures taken by JRCC member companies for energy-saving in fiscal 2003 are shown in the graph on the right hand side as a result of compilation of the JCIA's "Voluntary Save-Energy Action Plan for Environmental Conservation," in which most of JRCC member companies are participating.



Global Warming Countermeasures

(1) Offer of energy saving products

The products contributing to energy saving have been developed and offered.

- Development of and making into products such insulation materials for houses with upgraded air conditioning effect and durability
- Development of and making into products such materials for green tires which contribute to upgrading automobile's fuel consumption rate

(2) Initiatives taken in the transportation sector

Reduction of CO_2 emission in transportation has been tackled.

- Modal shifting (conversion from transportation by truck to higher energy efficiency mass transportation by sea or rail) in raw materials and products distribution.

(3) Countermeasures against Greenhouse Gases other than CO_2

Various measures have been taken to restrict emissions of greenhouse gases other than CO_2.

- Reduction of emission volume of N_2O gas generated in the manufacturing process by developing and installing the decomposition equipment
- Development of high performance insulating material not using flon family blowing agent
- Development of the destruction business to collect flon family gases from customers and to apply decomposing treatment, and development of the recycling technology to hydrofluoric acid

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 have been not only endeavoring to transfer the latest energy-saving and environmental preservation technologies, processing technologies and high-efficiency machinery, but also educating local employees and proceeding with energy saving activities.

Environmental Preservation
(Reducing Emissions of Chemical Substances)

In July 1999, The Law Concerning Reporting, etc., of Releases to the Environment of Specific Chemical Substances and Promoting Improvements in Their Management (the PRTR Law) was enacted, and from fiscal 2001 onward assessment of the emission and transfer volumes to the environment, reporting and announcement of the results of the 354 chemical substances specified by the law have been made.
PRTR program (Pollutant Release and Transfer Register) makes assessing danger levels and identifying latent dangers to people and the environment, and is expected to reduce the risks by chemical substances.

History of JCIA Voluntary PRTR Efforts

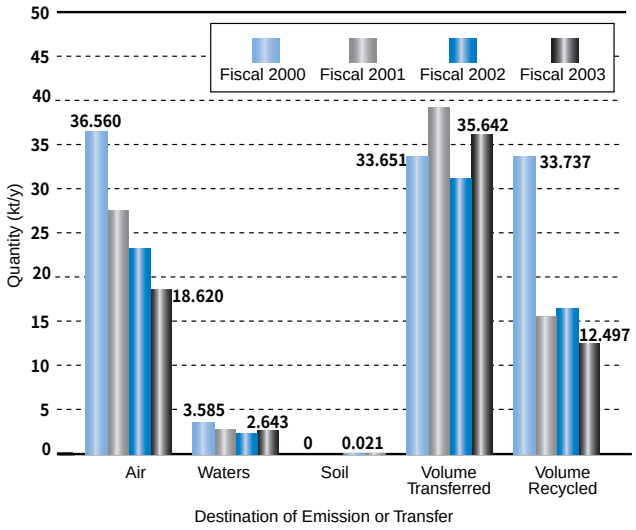
The JCIA has long considered the reduction of emissions into the environment essential to the chemical industry's gaining of public trust. In 1992, in advance of being obligated by law, the JCIA voluntarily conducted survey on PRTR programs in other countries and started a pilot survey on 13 chemical substances in Japan. In 1994, the 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. The 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 the 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. Even after the law went into effect, on the bases of the achievements antecedently made, reduction in the emission volume to the environment as well as in the transfer volume as waste has been progressing smoothly.

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 2000 - 2003 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 total emission volumes in fiscal 2000, 7 substances (last year: 5 substances) have turned down to less than 1000 tons emissions.

Summing up all the 354 survey substances, the total emission volumes in fiscal 2003 were about 21,284 tons, which is a reduction of about 47% compared with that in fiscal 2000. As detailed in the table, about 87.5% were emitted into air, about 12.4% into waters, and about 0.1% into soil in fiscal 2003.
The majority of emission volumes are emissions into the air. The successive challenge is to further reduce the emission volumes into the air.

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



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

Selected PRTR Survey Results

Figures show the results in each year in order from top to bottom line.

Top Line: Fiscal 2003 (Tons/Year)
2nd Line: Fiscal 2002 (Tons/Year)
3rd Line: Fiscal 2001 (Tons/Year)
Bottom 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	**4,472**	**82**	**0**	**4,554**	**9,599**	**3,801**	**13,400**	**72**
	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	**2,026**	**2**	**1**	**2,029**	**1,150**	**1,137**	**2,287**	**47**
	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	**1,522**	**0**	**0**	**1,522**	**35**	**1**	**36**	**23**
	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	**263**	**1**	**0**	**264**	**2**	**0**	**2**	**12**
	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	**947**	**32**	**0**	**979**	**68**	**867**	**935**	**29**
	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	**911**	**27**	**0**	**938**	**1,416**	**1,136**	**2,552**	**71**
	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	**304**	**200**	**0**	**504**	**2,010**	**80**	**2,090**	**48**
	399	292	0	691	2,267	138	2,405	46
	1,114	154	2	1,270	2,086	75	2,161	43
	1,430	156	0	1,586	1,250	299	1,549	44
HCFC-142b	**461**	**0**	**0**	**461**	**0**	**0**	**0**	**7**
	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	**692**	**12**	**0**	**704**	**1,058**	**916**	**1,974**	**53**
	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	**449**	**2**	**0**	**451**	**0**	**0**	**0**	**13**
	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.
Further, the handling volume of the object substances for report was changed from conventional 5 tons and over to 1 ton and over starting with fiscal 2003 report based on the law.

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	Waters	Soil	Total	Volume Transferred	Volume Recycled	Total
PRTR Substances Total	**18,620**	**2,643**	**21**	**21,284**	**35,642**	**12,497**	**48,139**
	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

3. Totals of Emission Volumes and Externally Treated Waste Volumes of JCIA Survey Substances Total 480 Substances (Including PRTR Specified 354 Substances)

	Emission Volumes (T/Y)				Externally Treated Volumes (T/Y)		
	Air	Waters	Soil	Total	Volume Transferred	Volume Recycled	Total
JCIA Survey Substances Total	**51,900**	**8,495**	**81**	**60,476**	**75,871**	**125,367**	**201,238**
	58,334	8,895	102	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
(Reducing Emissions of Chemical Substances)

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.
Primary emission volumes trend was worked up into the table.

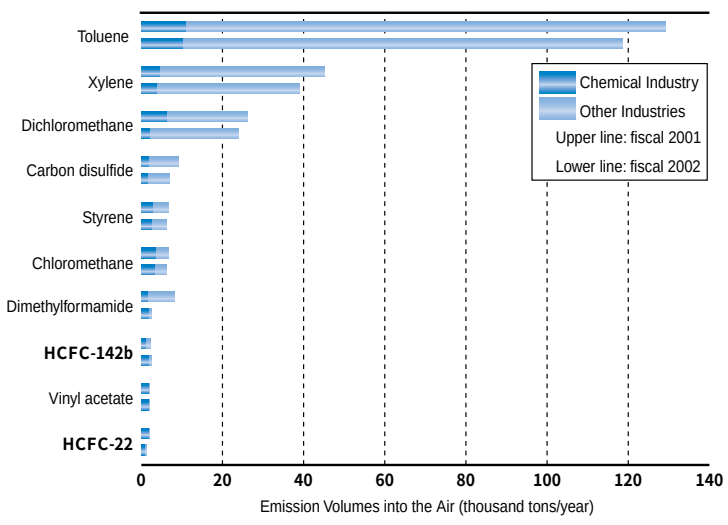
*** Environmental Impact Levels: Business fields of member companies vary so much that environmental impact levels could not be expressed by the same production volume unit, therefore they were compiled by sales amounts (million yen).**

Emission Volumes of Air Pollutants/Water Pollutants

	1995	2000	2001	2002	2003
SOx Emissions (kt/y)	68.2	60.2	57.1	51.0	51.1
Environmental impact levels (kg/mil.¥)	4.52	3.84	3.79	3.36	3.02
No. of companies reporting data	77	84	93	92	98
NOx Emissions (kt/y)	103	106	103	99.7	101
Environmental impact levels (kg/mil.¥)	7.19	6.70	6.80	6.56	5.96
No. of companies reporting data	79	88	93	95	99
Dust Emissions (kt/y)	5.05	5.50	5.03	4.50	4.21
Environmental impact levels (g/mil.¥)	359.77	353.60	332.51	295.27	251.49
No. of companies reporting data	73	85	93	93	95
COD Emissions (kt/y)	32.7	30.4	27.5	27.2	24.1
Environmental impact levels (kg/mil.¥)	2.23	1.93	1.81	1.79	1.42
No. of companies reporting data	81	91	97	97	99
Total Nitrogen Emissions (kt/y)	-	-	30.6	34.3	30.4
Environmental impact levels (kg/mil.¥)	-	-	2.46	2.46	1.92
No. of companies reporting data	-	-	74	83	86
Total Phosphorus Emissions (kt/y)	-	-	0.99	0.98	0.90
Environmental impact levels (g/mil.¥)	-	-	81.7	70.1	56.7
No. of companies reporting data	-	-	73	84	85

The graph shows, comparing "chemical industry" classification with "other industries" classification, concerning the substances which exceeded 1000 tons/year in their into-the-air emission volumes of JRCC member companies in fiscal 2000, from the PRTR survey results for fiscal 2001 and 2002 which the government publicized.
Comparison between fiscal 2001 and fiscal 2002 indicates that, in terms of the aggregate of 10 substances shown in the graph, a decrease of 16.8% from 25,218 tons to 20,976 tons exists in the chemical industry sector, while in the other industries sector 10% decrease from 198,373 tons to 178,574 tons is found. This means that the chemical industry made more positive efforts to reduce such emissions into the air.

Chemical Industry's Proportion at Emission into the Air



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.

What are the 12 substances?

22 substances were listed up at the Central Environment Council as "Substance to tackle by priority" out of harmful air pollutants which are in danger of giving harm to human health even at low concentration through long-term intake. Of these, the 12 substances were selected considering potentiality of carcinogenicity, production or import in quantities above a specified amount, actual detection in the environment, etc. These are voluntarily managed items by businesses. The chemical industry has replaced nickel compounds with ethylene oxide.

Results of 2nd Term Voluntary Management Plan and Future Efforts

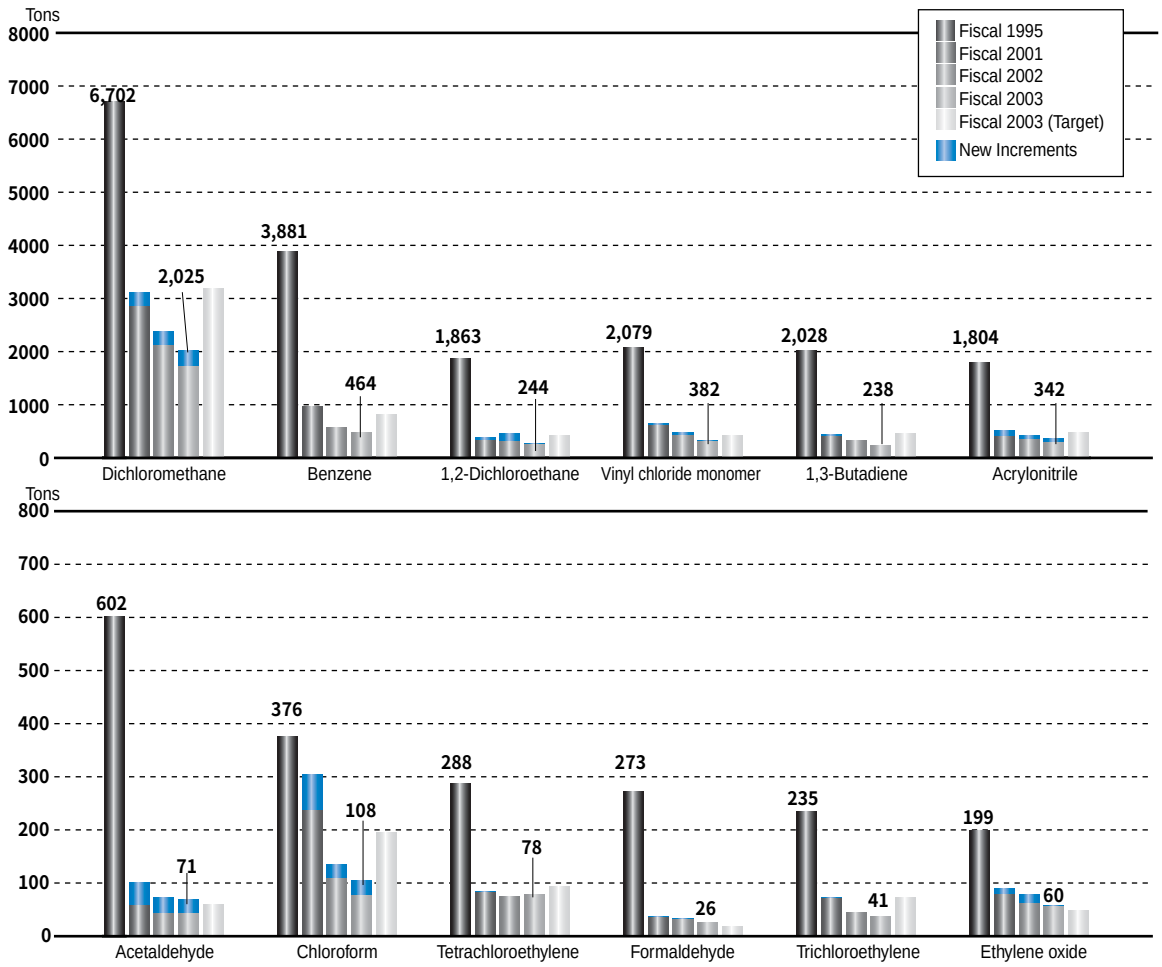
The chemical industry centering the JCIA drew up the 1st Term Voluntary Management Plan (set a reduction target in fiscal 1999 making fiscal 1995 as the criterion) and the 2nd Term Voluntary Management Plan (set a reduction target in fiscal 2003 making fiscal 1999 as the criterion), with the JRCC jointly, and has taken the initiative in reducing emission volumes of the 12 substances to tackle by priority.

While fiscal 2003 is the last year of the 2nd Term Voluntary Management Plan, with 10 substances of the 12 substances the target in fiscal 2003 could be achieved (target ratio 42 - 88%) as shown in the graph below. In the meantime, the effects of the implemented reduction technologies and information on the costs have been disclosed by questionnaire, and more than 700 examples have been publicized on the website of NITE (National Institute of Technology and Evaluation), at which anybody can take a look.

In addition, as regards the emission volume control on the volatile organic compound (VOC), the chemical industry, prior to legal control, determined to make voluntary management of VOC emission, and started to study how to take the initiative.

The JRCC intends to continue to take such voluntary initiative in the future.

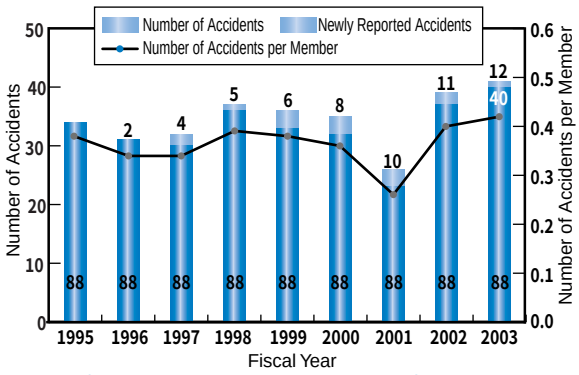
Transition of Emission Volumes of Harmful Air Pollutant 12 Substances



Process Safety and Disaster Prevention

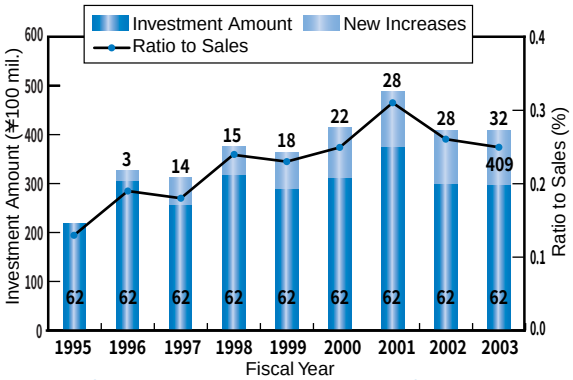
The number of plant accidents per a member company has shown an increasing trend for the last two years, and after year 1995 fiscal 2003 marked the most number of accidents.
This trend appeared all over the whole manufacturing industries, and an exceptional official notice from competent authorities to the manufacturing industries was delivered. Each JRCC member company, in conformity with the notifications from the associations concerned such as the JCIA, reviewed its process safety and disaster prevention system, and at the same time it has more than been ever 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, etc.) and Administrative safety measures (Preparation and clear statement of safety guideline and manuals, Periodical auditing, etc.).
Investment by members in process safety and disaster prevention in fiscal 2003 amounted to approximately 41 billion yen almost the same as in the previous fiscal year, and treating fiscal 2001 exceptionally as part of companies made an immense investment, the ratio to sales has kept such high level of more or less 0.25% since fiscal 1998.

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



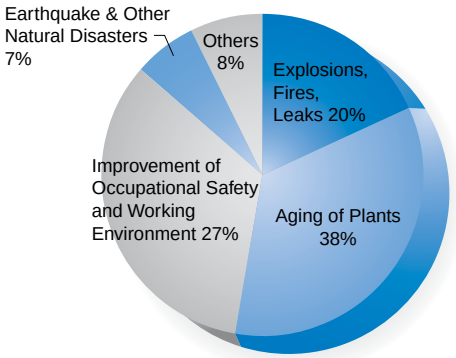
Number of data reporting companies was 88 in fiscal 1995, since then increased gradually, and it became 100 in fiscal 2003 (Numbers in the upper portion of the bar graph indicate the increase in the number of member companies reporting data).

Investment in Safety and Disaster Prevention



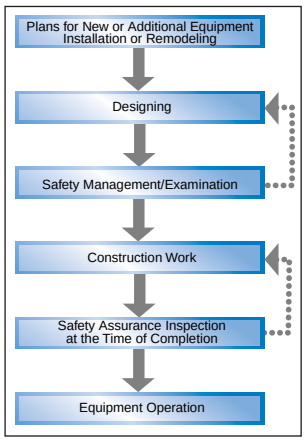
Number of data reporting companies was 62 in fiscal 1995, since then increased gradually, and it became 94 in fiscal 2003 (Numbers in the upper portion of the bar graph indicate the increase in the number of member companies reporting data).

Investment in Process Safety and Disaster Prevention Measures in Fiscal 2003

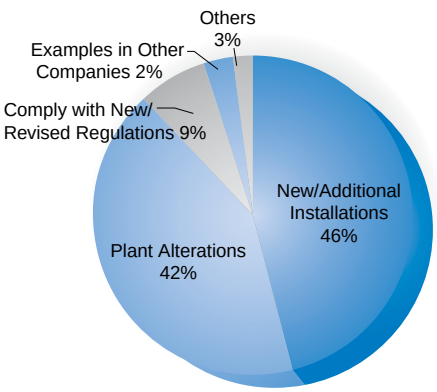


Prior Facilities Management and Assessment

As a result of survey by questionnaire, it turned out that more than 90%, higher than in the previous year, of member companies had some assessment criteria and conducted prior facilities safety assessment. Approximately 90% of execution motives consist of installing new or additional equipment or of remodeling equipment. Many member companies as shown in the flowchart on the right, before starting the construction work, 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.



Reasons for Prior Plant Safety Assessments in Fiscal 2003



Reviewing Voluntary Security Inspection

In the last fiscal year, illegality turned out on the voluntary security inspection which five member companies made as an approved undertaker based on High Pressure Gas Security Law.

It goes without saying that the law should be abided by on the one hand, but each member company recognizes that voluntary management is a fundamental theme of Responsible Care on the other hand. Taking this opportunity, for the purpose of preventing recurrence the 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 1970 (Ministry of Health, Labour and Welfare survey). In addition, the lost time injuries rate of JRCC member companies and member company contractors had generally been on the slightly downward trend since 1995, being lower than and approximately half of the manufacturing industry average, but it appeared to touch bottom in 2000 and thereafter it has been on the increase trend.

As regards the severity rate, especially in the case of member company contractors, an increase from the bottom in year 2002 is seen, while the case of member companies indicates on the slightly increasing trend. However, continuous efforts should be required hereafter the same as before for attaining zero accident.

In terms of the number of fatalities, a decreasing trend was seen for these several years, but year 2003 showed an increase. The same as in the case of the lost time injuries rate and the severity rate, efforts for further improvement must be required.

Number of Fatalities

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Member Companies (JRCC)	2	3	4	3	3	2	1	1	2
Member Company Contractors (JRCC)	4	6	5	9	4	1	3	1	3
Chemical Industry (MHLW)	35	39	34	30	28	26	24	27	25
Manufacturing sector (MHLW)	417	405	351	305	344	323	326	275	293

MHLW=Ministry of Health, Labour and Welfare

Introduction of Occupational Safety and Health Management System (OSHMS)

The movement to eliminate labor accidents has been risen 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 in regard to OSHMS the JRCC conducted to its members are as shown below.

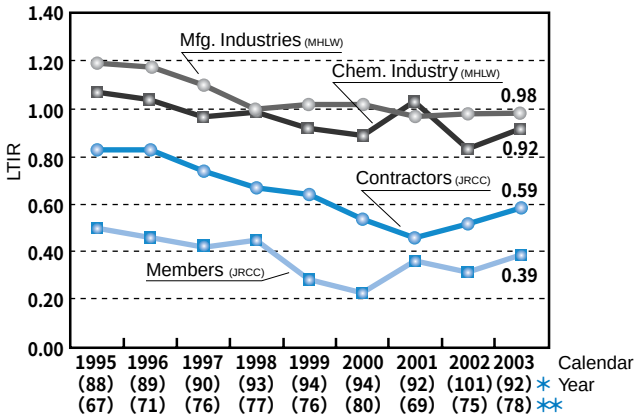
○Members that have already introduced OSHMS: 28% (previous year 23%)

○ Members considering introducing OSHMS:40% (previous year 40%)

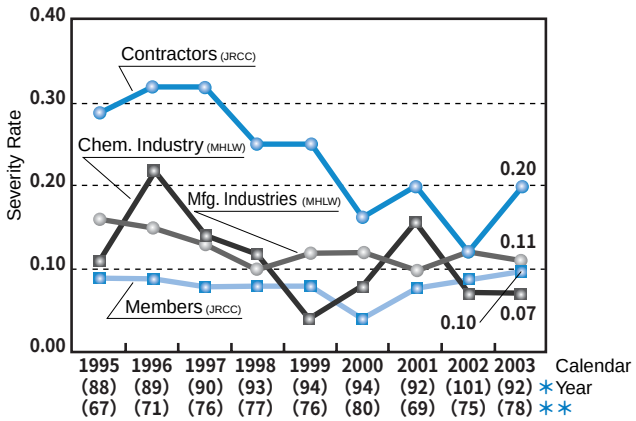
Thus, the number of the member companies that have already introduced OSHMS increased to 28% from 23% in the previous year, approximately doubled compared to two years ago.

The number of the member companies considering introducing OSHMS remained the same as the previous year 40%.

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, the JRCC and its each member company strive to implement "Comprehensive voluntary safety management of chemical substances" through diversified initiatives taken.

Legal Control Trend Relating to Chemical Safety/Product Safety, and JRCC/ Japan Chemical Industry Association's Efforts

Legal control trend relating to chemical substances in Japan and overseas

In Japan, amendment of Chemical Substance Inspection Control Law was promulgated in May 2003, which intensifies inspection of chemical substances such as introduction of inspection/control system from the viewpoint of prevention of damage to animals and plants, introduction of first class watch chemical substance system, etc..

EU, on the other hand, in October 2003 publicized a final draft of European new chemicals control REACH.* In addition, a directive on End of Life Vehick (ELV) for the purpose of waste reduction of automobiles and promoting recycling went into effect, and a directive on Restriction of Certain Hazardous Substances (RoHS) in electric/electronic apparatus was promulgated.

JRCC/Japan Chemical Industry Association's Efforts

In response to the overseas movement on chemical substances relating legal control, Japan Chemical Industry Association in July 2003 presented comments on the draft of REACH. Further, in order to improve the problems of the draft, "REACH-responsive council" was established both in Japan and Europe in September 2004, which has been studying the countermeasures. Also, the JRCC intends to show the product stewardship of chemicals more proactively.

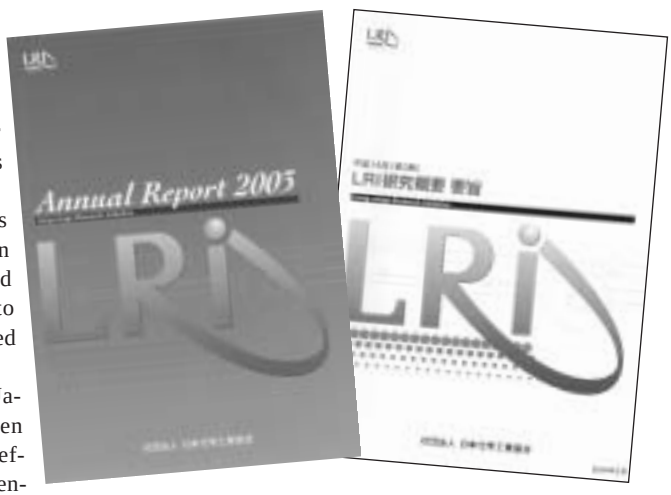
*** REACH: Abbreviation of Registration, Evaluation and Authorization of Chemicals. Several years later, by legalization of this regulation, it is foreseeable that it cannot help implementing the following strict measures: ① For a manufacturer of an importer of not less than 10 tons chemical substances to obligate making up the chemicals safety assessment sheet; ② To transfer the duty to implement risk assessment to industries; ③To obligate to make the same registration and evaluation to the existing chemical substances as to the new chemical substances, etc.**

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

OECD (Organization for Economic Cooperation and Development) pursuant to the Agenda 21 adopted at the UN Environment Development Conference has been proceeding with the project about the substances lacking basic hazardousness 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 in a country is not less than 1,000 tons). The International Chemical Council Association (ICCA) similarly as one of the Responsible Care activities set a target to assess 1000 substances by the end year 2004, and has positively participated in this project as a voluntary activity centering three associations in Japan, U.S.A., and Europe. As of July 2004 acquisition of data of 905 substances and making their assessment were promised, of which 236 substances assessments have already completed.

Japan has made assessment documents of 640 substances by approximately 100 companies' positive cooperation starting with JRCC member companies, has finished assessment of 44 substances , a large number next to U.S.A. and Germany, which has been highly appreciated from abroad.

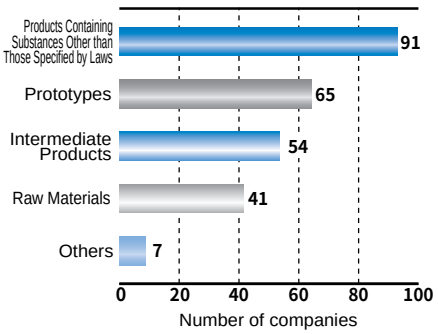
Further, the chemical industries of the three poles of Japan, United States, and Europe have cooperatively been proceeding with long-term voluntary research on "the effects of chemical substances on human health and the environment" the LRI (Long-range Research Initiative). This activity is a voluntary one which publicly collects research themes on the important problems for the chemical industry such as "Endocrine disrupting chemical substances", "Chemical carcinogenesis", "Hypersensitivity", etc., and intends to solve the problems. In 2003, a summary of researches made up to date were worked up into a pamphlet. The status of LRI activities can be viewed on the following web site:
http://www.j-lri.org/



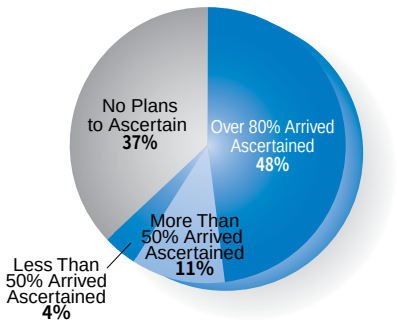
Status of Maintenance and Distribution of MSDS

MSDS (Material Safety Data Sheet) is a document for an enterprise handling chemical substances to grasp the properties of the chemical substances contained in the product, and their handling method, etc., and is distributed to the users at the time of delivery of the product. MSDS is revised from time to time based on amendment of relevant laws, acquisition of new risk information, provision of information from manufacturers, etc.

MSDS Application to Substances Other than Those Specified by Laws



Arrival of MSDS at Customers



The substances to which MSDS should be delivered are specified by laws*, but 91 companies out of 99 JRCC member companies voluntarily issue MSDS for other substances than those specified by laws, and a majority of such companies deliver MSDS for all products (refer to the graph for detail).

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

Of 95 member companies issuing MSDS, 19 companies deliver it directly to the customers, and 76 companies deliver it from outside such as agencies, etc. At such 76 companies, number of the member companies which traced and ascertained arrivals of MSDS of revised edition at end-users was 48 (making outside-route MSDS delivery companies as denominator: 64%). Ascertaining status is as follows (refer to the circle graph):

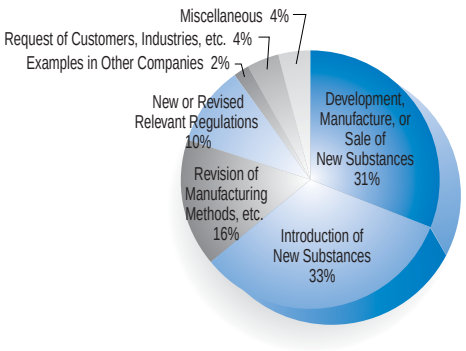
Ascertained arrival:	**Over 80% arrived: 37 companies (48%)**
	Over 50% arrived: 8 companies (11%)
	Less than 50% arrived: 3 companies (4%)
Not ascertained arrival:	**Scheduled to ascertain: 11 companies (14%)**
	No schedule: 16 companies (21%)

Results of Prior Chemical Substance Safety Assessments

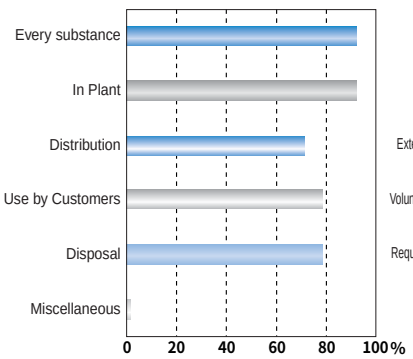
Prior chemical substance safety assessments, which based on "the JCIA's Guiding Principles for the Improvement of Environmental, Safety and Health Conditions", focus on safety of chemical substances (explosion, fire, acute and chronic toxicity, etc.) and assess the effects to the people handling them and to the environment, are applied to the existing products as well as new chemical substances. Such assessments are useful not only for risk reduction measures but also for response in emergencies.

94% of JRCC member companies have their own prior safety assessment codes. Their objects and bases are as follows:

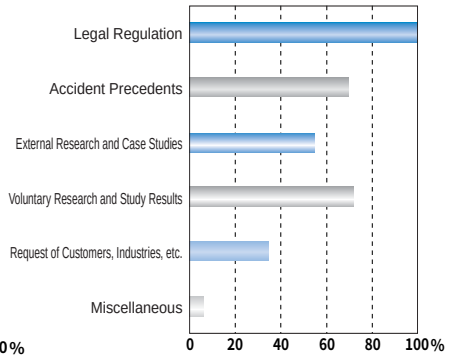
Motives for Conducting Prior Safety Assessments



Objects of Codes of Prior Safety Assessments (Plural Replies)



Basis of Codes of Prior Safety Assessments (Plural Replies)



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

The JCIA is promoting to utilize an Emergency response card that contains information on appropriate measures for the persons concerned such as trailer drivers, fire fighters, and policemen should an accident occur during transportation of chemical substances and high pressure gases. As written on yellow card, this card is called "Yellow Card".

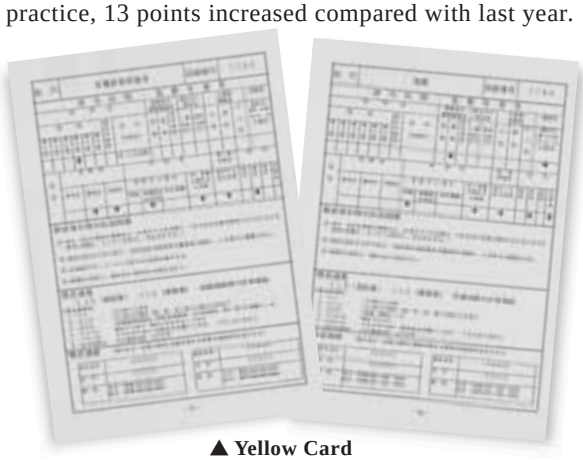
Meanwhile, in the case of transportation by consolidation or vessel transportation of small quantity, UN number and/or emergency measure guideline number are occasionally added to the label affixed to the container, which is called "Container Yellow Card".

Status of Carrying Yellow Card

Replies were received from 98 member companies. Of these, 96% of members carried Yellow Card at the time of delivery.

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 89 member companies. Of these, 47% of them were still considering the introduction, but 53% of them, although it is still a part of them, put the Container Yellow Card in practice, 13 points increased compared with last year.



▲ 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.

① Status of Possession and Pervasion of Emergency Response Manuals

95% of members possess emergency response manuals.

② Status of Setting up of 24 Hours Communication Network

94% of members centering on large-scale enterprises maintain 24 hours communication network.

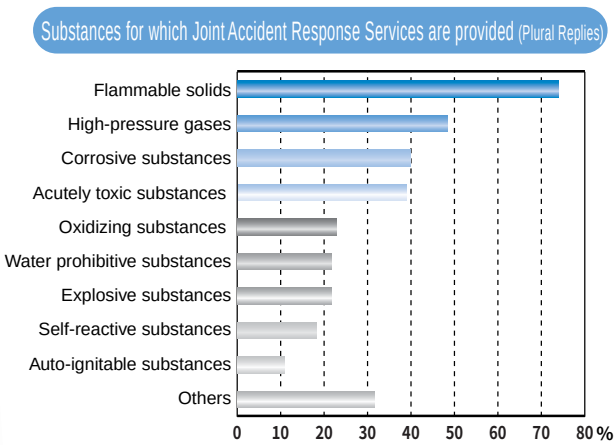
③ Execution of Emergency Response Drills

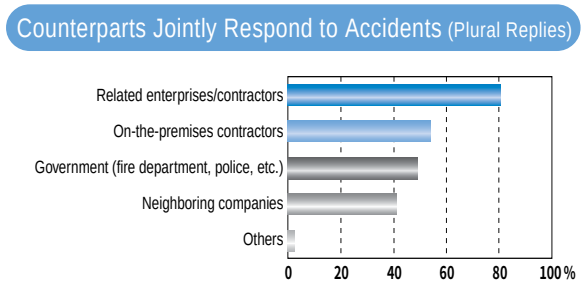
85% of members have executed emergency response drills.

Joint Accident Response Services

Responding to emergency, 83% of members maintain joint accident response services.

Object substances are flammable solids/gases and high-pressure gases, corrosive substances, acutely toxic substances, etc. and the counterparts that jointly respond to accidents are related enterprises/management, on-the-premises contractors,administration, etc.

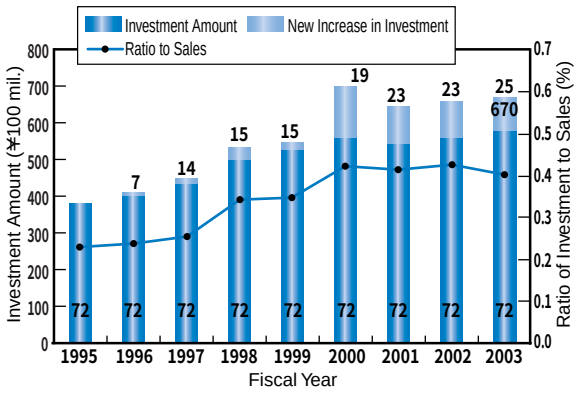




Investment in Environmental Preservation

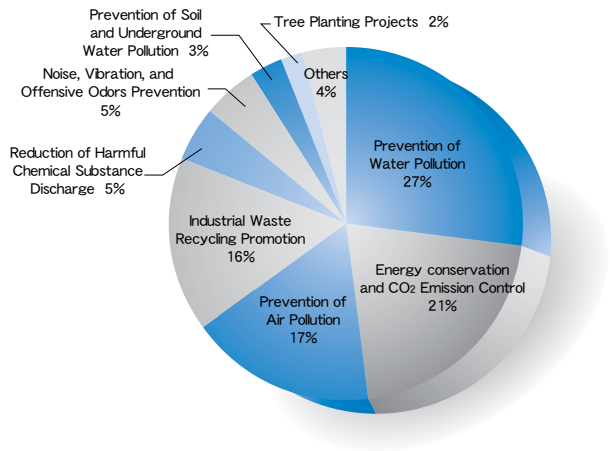
The amount of investment in environmental preservation and its ratio to sales in fiscal 2003 turned out to be 1.8% increase compared with the previous fiscal year. The ratio of the amount of investment in environmental preservation to sales has maintained not less than 0.4% for these several years (refer to the right chart). Despite the continuity of severe economic situation, JRCC member companies recognize the importance of the environmental preservation and have continuously invested in environmental preservation.
The chart below shows the breakdown of the investment. The same as in fiscal 2002, measures to prevent Water pollution (COD measures, etc.) accounted for 27% of total and headed the list, but in the second rank, in place of Air pollution prevention measures (SOx, NOx, soot and dust, etc.) , the investment in Energy conservation and CO_2 Emission Control, which was in the third rank in the previous fiscal year, rose. This result is considered to reflect the fact that each member company made positive investment in the prevention of global warming.

Investment in Environmental Preservation



***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.**

Investment in Environmental Preservation for fiscal 2003



Environmental Accounting

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 to 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, enterprises may try to have communications with the stakeholders such as consumers, local residents, and investors.
As a guideline on the environmental accounting for enterprises, the Ministry of the Environment published in March 2002 "Environmental Accounting Guidebook 2002 Edition." As this was meant to be utilized generally by any industry, the JRCC and Japan Chemical Industry Association started activities by a working group on environmental accounting and made up in November 2003 "Environmental Accounting Guideline for Chemical Enterprises." This guideline can be viewed at JRCC's website: http://www.nikkakyo.org/organizations/jrcc/kijyun/index.html
This guideline gives computation examples in close touch with chemical enterprises' actual condition in terms of environmental preservation cost, environmental preservation effect, economic effect, etc., making the contents easy to understand and utilize. In addition, this guideline will give such merits as to facilitate comparison between enterprises.Therefore, the JRCC will take the initiative in promoting this guideline to pervade and take root in the chemical industry.

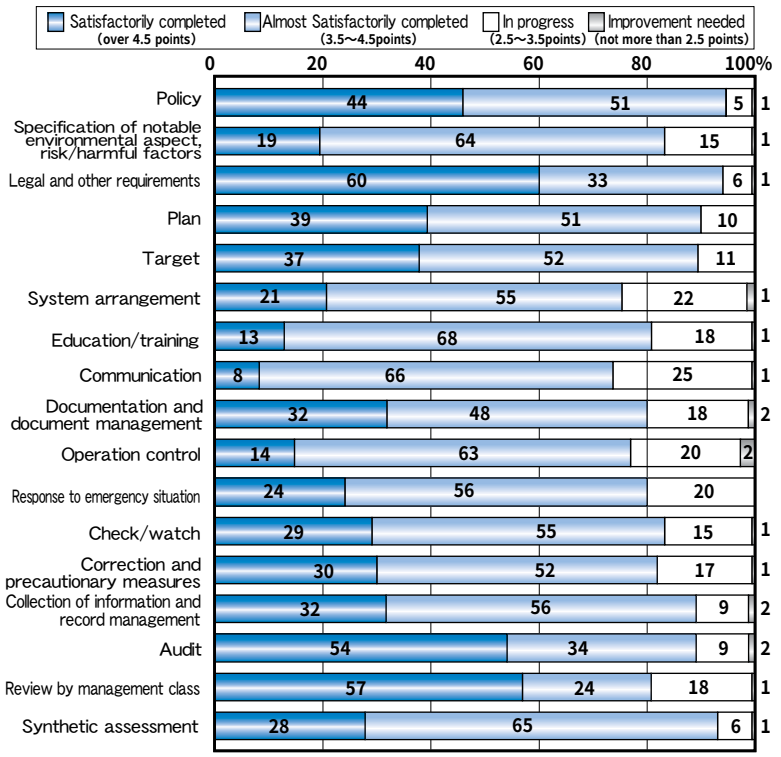
Responsible Care Initiative of JRCC

Member companies make self-assessment on their Responsible Care activities, and depending on the result, in order to improve their systems and initiatives taken by rotating PDCA by themselves, conduct internal audits every year based on the JRCC's common indicators.

Indicators for the internal audits consist of 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, and based on the check list respectively, they are marked as per items of policy, target, plan, check/watch, etc. on a five-point system.
Below shown are the results of 85 member companies' assessment by classifying 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. For your information, as in fiscal 2002 many members made the self-assessment by conventional indicators taking a temporary measure, comparison with fiscal 2002 is not made.

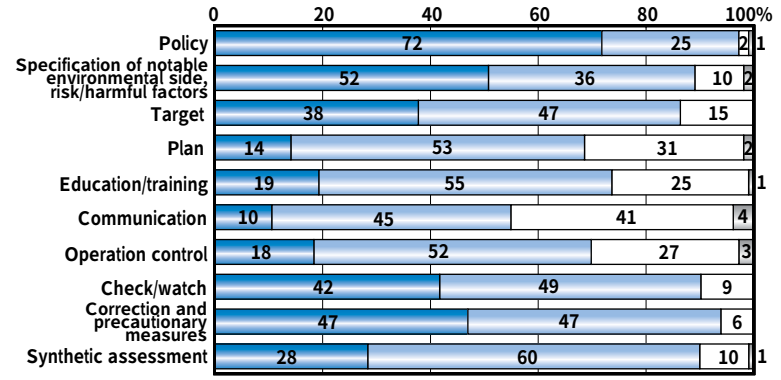
① Management system

Introduction of management system such as ISO14001, ISO9000, and OHSAS18001 has been in progress, and accordingly, almost satisfactory levels have been generally reached. Especially with the items of policy, specification of requirements, audit, and review by management class, nearly half items reached satisfactory levels.
On the other hand, items such as education/training, communication, and operation control scarcely won "satisfactory" assessment, and their leveling up will be an issue hereafter.



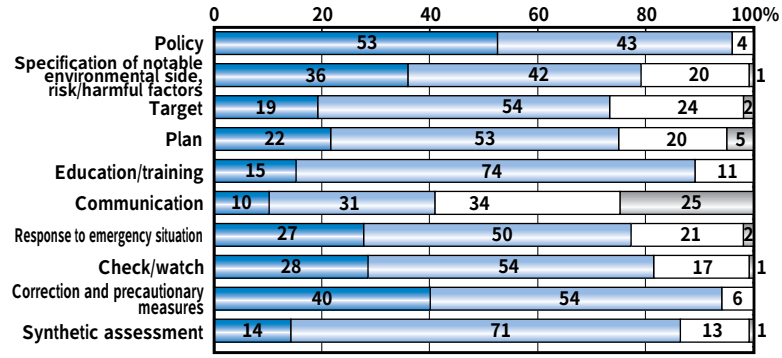
② Environmental preservation

As seen by questionnaire 90% of members acquired authorization of ISO14001, etc., introduction of management system has been in progress, with the items of policy, specification of requirements, correction and precautionary measures, and check/watch, 90% reached satisfactory levels.
On the other hand, repletion of communication is required, and with the items of which checklist requirement extends for a wide range such as plan, education/training, and operation control, repletion of contents will be an issue hereafter.



③ Process safety and disaster prevention

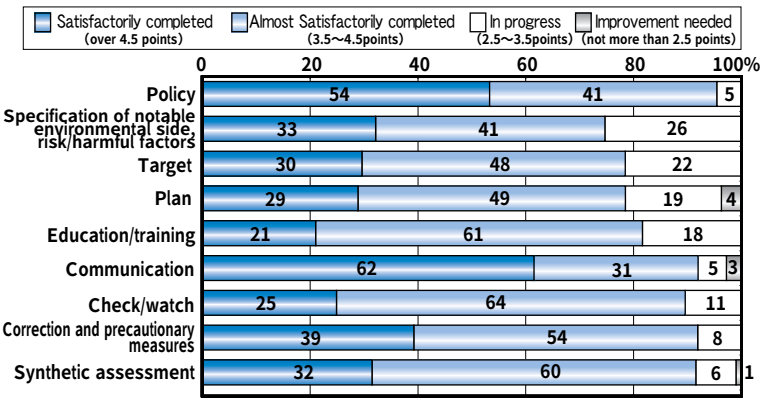
By efforts made up to now, repletion with the items of policy, education/training, and correction and precautionary measures has proceeded. With the items of target, plan, and response to emergency situation, dispersion was seen. Meanwhile, assessment on this communication item marked the lowest of the 7 codes, and its repletion will be an issue hereafter.



Members (Member's Self-assessment)

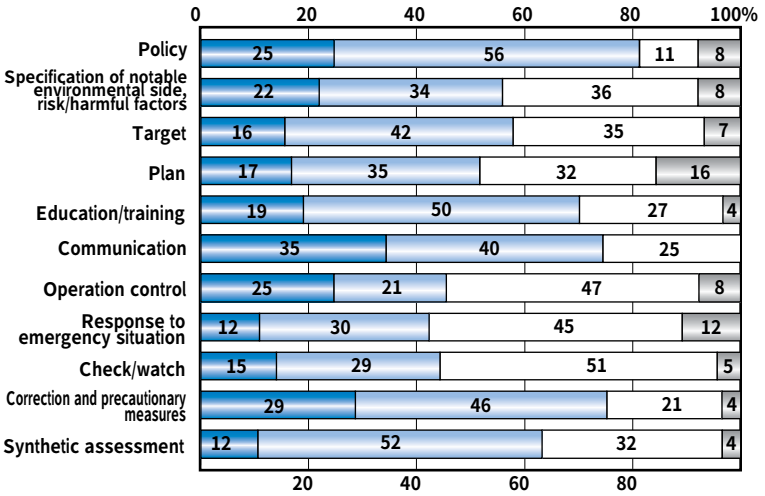
④ Occupational health and safety

Efforts made up to now and promotion for introduction of OSHMS, members required for repletion became very few. As regards communication, the contents being assessed under this code, the assessment resulted in being higher than under the other codes.



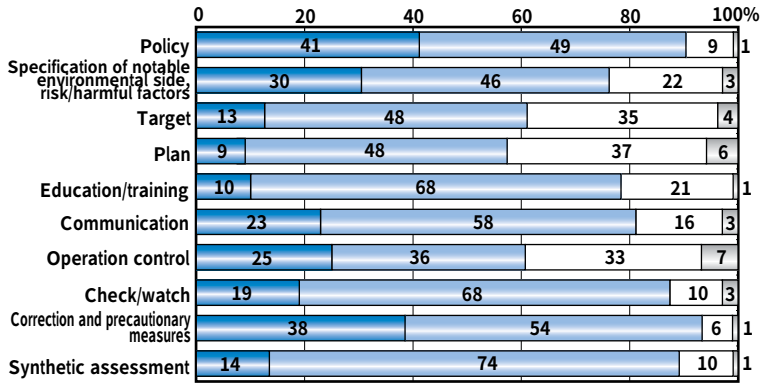
⑤ Distribution safety

The assessment results turned out that totally repletion was not proceeded yet. Such results may be ascribable to the causes: in case product transportation is entrusted to outside contractors, full guidance may not be given; or depending on the member, in view of the product's hazardousness/harmfulness, priority/emergency for repletion may be deemed low.



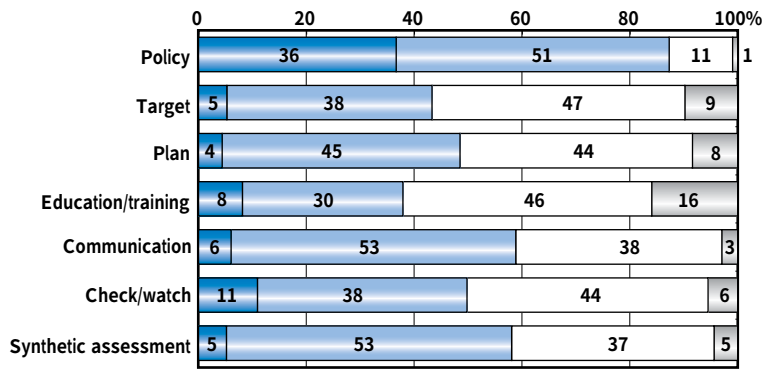
⑥ Chemical and products safety

According to the synthetic assessment, it was assessed that approximately 90% has nearly been completed, but to proceed with a project by setting target and by making plan may be said a problem. And with the item of operation control the contents of the checklist comprise assessments centering around cooperation and technology transfer overseas related to Responsible Care, and therefore building up a close connection may be an issue for repletion.



⑦ Dialogue with communities

In view of the synthetic assessment, this code became the lowest assessment of the 7 codes. At other codes also, assessment in terms of communication with local community was marked low. Repletion of communication centering on local districts is to be required.



Responsible Care Initiative 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

Strengthening of risk management/compliance, VOC control response, Building-up of safe transportation management system, Development of other than flon and substitute technology of HFC, etc.

② Items in which Challenging Members has been Increasing

JRCC 's third party verification, Zero emission of wastes, Green purchase/procurement, Issuing of site report, Repletion of CSR part of environmental report, Support of RC activities by overseas affiliate companies, Mental healthcare, Introduction of OSHMS, Introduction of container Yellow Card, Survey of Europe REACH, etc. relative regulations, etc.

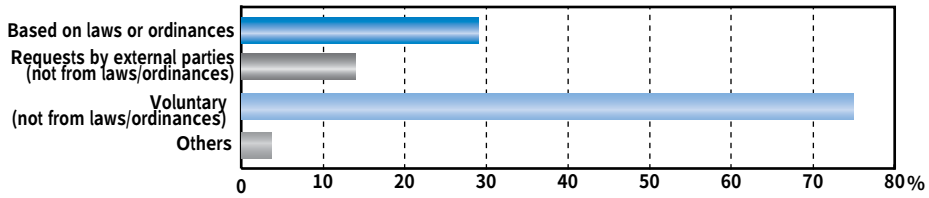
Soil and Underground Water Contamination

In fiscal 2003, 98 member companies answered, of which 63 companies, equivalent to 64%, conducted investigation on soil and underground water contamination at 132 places in total. Of these, at 30 places (23%) in total by 22 companies' investigation, contamination exceeding the reference value was discovered.

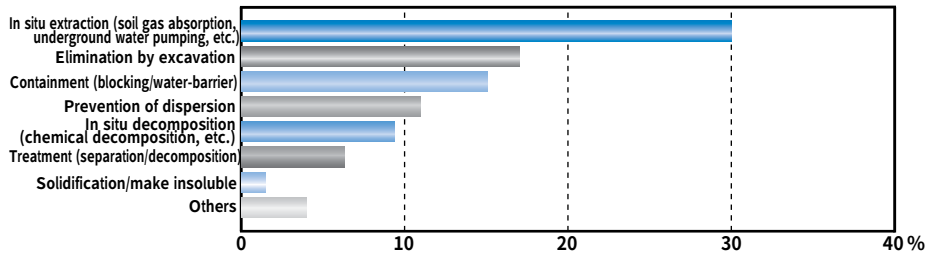
As motives for investigation (by duplicate answers), voluntary investigation occupies highest 75% of the motives, and 29% was for the investigation based on laws or ordinances.

32 companies took the antipollution measures at 53 places in fiscal 2003 including the investigated places in the past, and the method of the measures were as described in the right graph.

Motives for Conducting Investigation



Anti-pollution Measures (multiple answers)

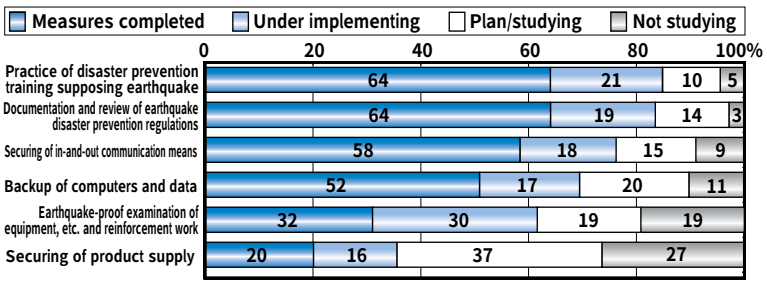


PCB

97 member companies answered, of which 81 companies (84%) preserve PCB wastes (waste of PCB or equipment, etc. containing PCB), and only one company could dispose such wastes in fiscal 2003 under the condition that setting up of PCB wastes treatment facilities is still future matters.

Responding to Large-scale Earthquakes

In year 2003 earthquakes occurred frequently in the Hokkaido/Tohoku district, and there exist certain districts that have rising probability of large-scale earthquake occurrence in the first half of this century. The status of various measures prepared supposing occurrence of these large-scale earthquakes are as per the graph shown on the right.



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 2003, 63 members, equivalent to a little less than 70% of the answered members, issued Responsible Care reports, thus on the steady increase.

② Number of companies issuing local edition Responsible Care reports

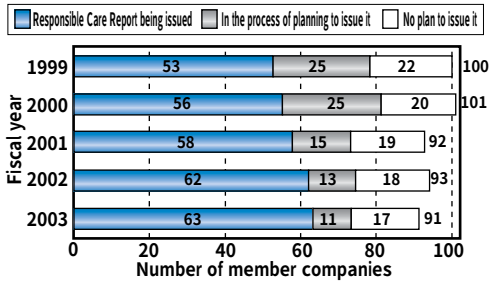
Number of member companies issuing local (site) reports is steadily increasing year after year. 23 members issued them in fiscal 2003. In addition, 39 members, equivalent to 62% of Responsible Care reports issuing members, have prepared pages for local data (site data) in their company-wide edition.

③ Contents of the report

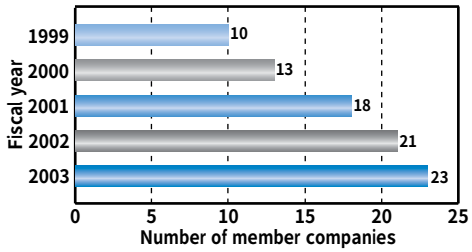
As report on Responsible Care activities, it carries in terms of the implementation items of Responsible Care (Environmental preservation, Process safety and disaster prevention, Occupational health and safety, Chemical and product safety, and Distribution safety) and Communication with the community (dialogue). Of these, articles' carrying rate on the topic other than Environmental preservation has been reduced compared with fiscal 2002. Affected by the elevated interest in CSR (Corporation's Social Responsibility) in recent years, articles on social initiatives such as Human rights/Employment/Consumer protection, etc. have been increasing, and at the stage of making information disclosure beyond the framework of conventional Responsible Care report, it is considered that difference arises in the priority of adopting articles at each company.

Meanwhile, the number of members carrying third party's opinions in the report amounted to 24, and largely increased from the number 15 of members which undertook third party verification in the previous fiscal year. Verification of the report by Responsible Care Verification Center started, and such number will continue to increase in the future.

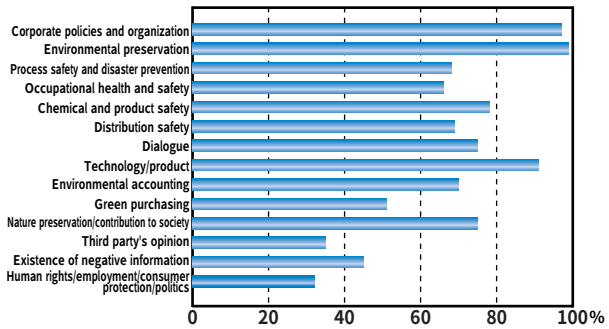
Issuance of Responsible Care Report



Issuance of Local Edition Responsible Care Report



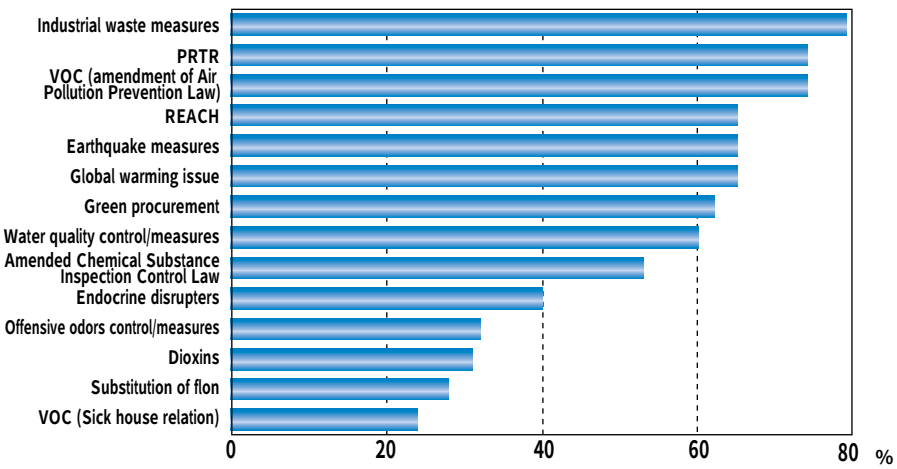
Report Contents



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

According to the plural replies from 98 JRCC member companies, interested matters in common were Industrial waste measures which was newly added to the items in questionnaire this time, PRTR, and VOC (Volatile Organic Compound) control by the amendment of Air Pollution Prevention Law, followed by REACH, Earthquake measures, Global warming issue.

The reason why interest in Dioxins, Flon substitution, and Sick house lowered, may be presumed because the effect of the measures such as Dioxins Countermeasures Law, response to amended Building and Construction Standard Law, etc. has become clarified, to which society's understanding has become deepened.



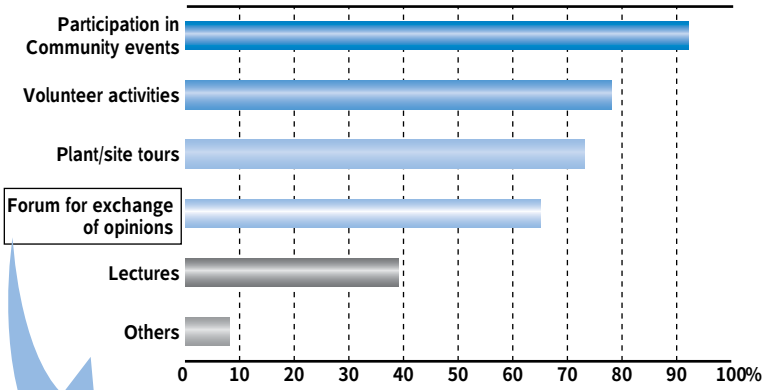
Responsible Care Initiative of JRCC

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.

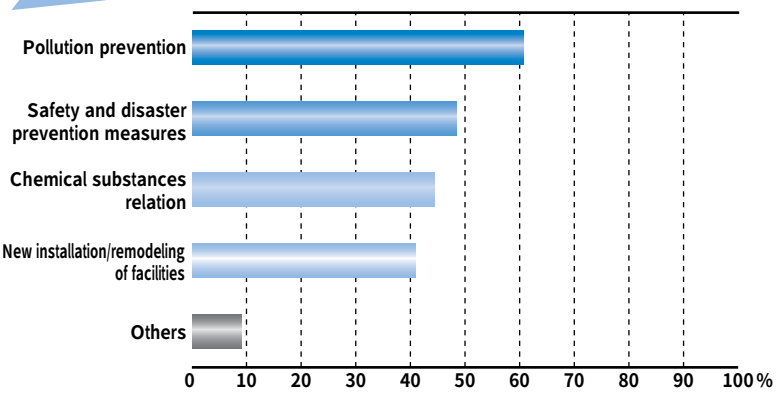
Communication with the Community

Member companies have been striving to have a variety of communication with local communities by coming in contact with the communities through participation in environmental activities and local events, cooperation and providing facilities to local events, and volunteer activities for cleaning/beautification campaign, and make efforts to contribute to the community. Likewise, in addition to lecture meetings, exhibitions, and plant visits, by giving chemistry classes to local elementary and junior high school students as well as by preparing learning by experience of company business, they are engaged in such activities for letting the residents further deepen understanding "Chemistry" and "Responsible Care." Member companies which prepare a place of opinion exchange and promote a dialogue increased to 65% in fiscal 2003 from 59% in fiscal 2002. Dialogue has been had on such theme as Pollution prevention and Safety and disaster prevention measures for accidents and disasters; Chemical substances relation (including PRTR); Prior explanation for new extension/remodeling of facilities, etc..

Means of Communication (multiple answers)



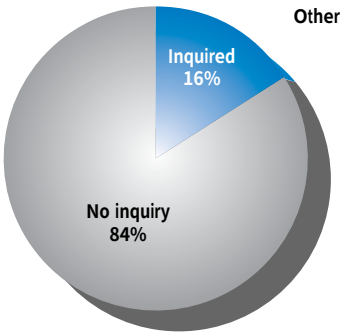
Themes at Forum for exchange of opinions (multiple answers)



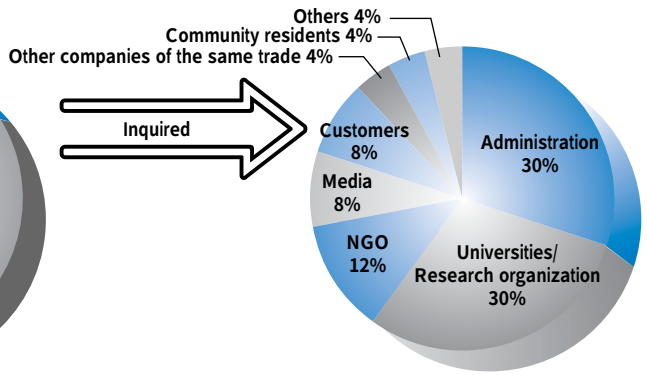
Inquiries on PRTR Publicized Data (multiple answers)

In March 2003 volumes of emission and transfer of chemical substances based on PRTR law was publicly announced for the first time. Members inquired regarding publicized data accounted for 16%, and its breakdown consists of administration and universities/research organizations 30% respectively, and NGO 12%, etc..

Existence of Inquiries



Breakdown of Inquiries



Members (Communication with the Community)

Beautification campaign

Plant tour

Biotope

Participation in local event

Chemistry class

Local disaster prevention training

JRCC Activities (Dialogue with the Public)

One of very important Responsible Care activities is, because it is voluntary management activities, 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, the JRCC has organized dialogue meetings as mentioned below.
In addition, the JRCC has been engaged in public relation activities such as issuance of the quarterly brochure to promote understanding of the JRCC's activities.

Community Dialogue

In 15 districts throughout Japan, including the 9 major petrochemical complex districts, the 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 2003, making the conversion to, and fulfilling of discussion-style forums and appropriate response to PRTR system as the basic policy, the JRCC held the community dialogue meetings in 5 existing districts (Kawasaki, Yokkaichi, Sakai/Senboku, Iwakuni/Otake, and Oita) and in 1 new district (Niigata Kita). With the plan of prior survey of residents' concern by questionnaire, incorporating plant tour into the schedule, etc., bidirectional dialogues have been promoted there. Such instance was seen on many occasions that speakers presented concretely about emission volumes of object substances and their reduction measures on the subject of PRTR.

In the district of Ube/Onoda, Yamaguchi Prefecture, with the cooperation of environmental NGO and Ube City, the JRCC held a forum meeting by a round-table method in a comparatively small scale. It was planned for the purpose of having a more concrete and fruitful exchange of opinions than at a large-scale district forum meeting.

Dialogue Meetings

The seventh dialogue meeting with "Consumers Japan" was held. Upon the theme of "Receiving the publication of PRTR data," mixing the explanation regarding "Analysis of PRTR data" by a 'chemical substances advisor' invited for the first time, an exchange of opinions was made actively.

In line with the business plan of holding a forum meeting in

Osaka similar to the one in Tokyo, a forum meeting with Kansai consumers groups was held in Kita-ku, Osaka in October 2003 for the first time.

With the participation of 5 persons from All Osaka Consumers Group, Kyoto Consumers Council (now Consumers Kyoto), etc. as consumers' side and 8 persons as enterprises' side, an exchange of opinions was made on chemical substances problem, etc.. Continuous holding in the future was confirmed with each other.

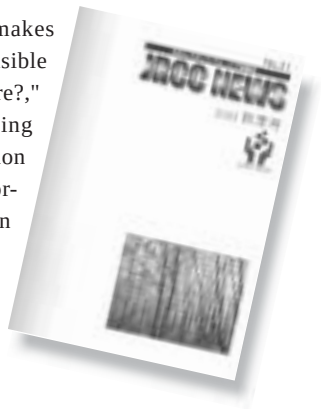
In addition, the JRCC continued in fiscal 2003 to organize in Tokyo (in October) and in Osaka (in March) the "Environmental dialogue and interaction" with the students who belonged to the "AIESEC Japan", a NPO corporation of economic/commercial sciences line students, and "IAESTE Japan" a NGO of science, engineering, and agriculture line students, both supporting international internships. This time the meetings were held incorporating a plant tour at the member company's business place, respectively, which was favorably commented upon by students as "It has given us a good experience to directly watch the enterprises' efforts for the environment."

Public Relations Activities

To have the activities and achievements of the JRCC, its members and members' facilities as well as international trend of Responsible Care known widely to the general public including its members, the JRCC publishes the quarterly JRCC News.

In addition, the JRCC homepage makes available an introduction of Responsible Care "Do you know Responsible Care?," "Reports," "JRCC News," "regarding Association," etc., and at "Information Pages" the JRCC has been endeavoring to timely deliver the information of the JRCC's activities.

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



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 2004 awards marked the 28th 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**
  Du Pont Kabushiki Kaisha Utsunomiya Plant
- **Safety Effort Award**
  Showa Denko K.K. Tokuyama Plant
  Teijin DuPont Films Japan Ltd. Gifu Plant
  Tonen Chemical Nasu Co., Ltd.
  Mitsubishi Gas Chemical Company, Inc. Niigata Research Center

Du Pont Kabushiki Kaisha Utsunomiya Plant

170 people including those who did not belong to the JRCC attended "Safety Symposium" held at Invention Assembly Hall on June 24 (Thursday) 2003. In addition to detailed presentations on the winners' safety activities, the panel discussion entitled "How to maintain an accident-free record" was held with Honorary Professor Yoichi Uehara of Yokohama National University in the chair.
Followings are winners' brief outlines and their safety records:

★ Du Pont Kabushiki Kaisha Utsunomiya Plant
Utsunomiya Plant was set up in 1983 as a manufacturing base in Japan of Du Pont Kabushiki Kaisha in Utsunomiya City, and has been engaged in manufacture and processing as well as research and development, etc.. It acquired ISO14001 certification in 2001. It employs 396 people, and has continued zero accident for 21 years since its startup of operation, and additionally for the last 5 years "untiring disaster" zero's perfect non-disaster continuing. This plant was honored with Ministry of Labour and Welfare's The First Class (3,600 thousand hours) Record Certificate in June 2001.

★ Showa Denko K.K Tokuyama Plant
Tokuyama Plant is located at a corner of Shunan City in Sanyo district, and manufactures chemical products such as acetaldehyde, ethyl acetate, etc., electronic materials, and high purity solvents. It acquired ISO9001 certification in 1996, and ISO14001 in 2000, respectively. It employs 134 people, and has continued zero accident for 12 years.

★ Teijin DuPont Films Japan Ltd. Gifu Plant
Gifu Plant is located in Anpachi County, Gifu Prefecture, commenced its operation as Teijin's film plant in 1971, and was transformed into a joint venture company with DuPont K.K. in 2001. The plant manufactures polyester film and polyethylene- naphthalate film. It acquired ISO9002 certification in 1997, and ISO14001 and OHSAS18001 in 1999. It employs approximately 500, and has continued zero accident for 6 years.

★ Tonen Chemical Nasu Co., Ltd.
As 100% subsidiary company of Tonen Chemical Co., Ltd. it is located at Industrial Zone in Nasu County, Tochigi Prefecture, and at the initial time of starting operations in 1990 it manufactured polyethylene pipes, but from 1997 it has been manufacturing separator film for lithium-ion cell. The number of employees is 106 currently, but it is increasing every year, accompanying expansion of demand. The plant has continued zero accident for 14 years since its startup of operation.

★ Mitsubishi Gas Chemical Company, Inc. Niigata Research Center
This Research Center started in 1952 as factory research section of Nihon Gas Chemical Co., Ltd., in 1971 it became current Niigata Research Center of Mitsubishi Gas Chemical Co., Inc., and in 1981 it moved from inside Niigata City to present Niigata Plant. It employs 74 persons, and has continued zero accident for 17 years.

※ 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=1331"

JRCC Activities
(Verification Program of Responsible Care Activities)

The Responsible Care Verification, which meets the third year in 2004, has been undertaken by the total number of 25 companies up to now, and has given steady results.

The Status of Undertaking Verification

Undertaken year and month	Name of the company	Undertaken year and month	Name of the company
Apr 2002	Tosoh (activities)	Apr 2002	ASAHI KASEI (activities)
Sep 2002	JSR (activities)	Dec 2002	Asahi Denka (activities)
Jan 2003	Mitsubishi Chemical (activities)	Apr 2003	KANEKA (activities)
May 2003	ASAHI KASEI (report)	May 2003	JSR (report)
Jun 2003	Kao(report)	Jul 2003	Mitsui Chemicals (activities)
Sep 2003	ASAHI KASEI (site report)	Nov 2003	Asahi Glass (activities)
Dec 2003	Tokuyama (activities)	Jan 2004	Asahi Denka (report)
Mar 2004	Ube Industries (activities)	Mar 2004	Nippon Paint (activities)
May 2004	Kao(report)	May 2004	JSR (report)
May 2004	ASAHI KASEI (report)	Jun 2004	Kyowa Hakko (report)
Aug 2004	Asahi Denka(activities)	Aug 2004	KANEKA (report)
Aug 2004	Showa Denko (activities)	Sep 2004	Dainippon Ink & Chemicals (report)
Oct 2004	Hokko Chemical (activities)		

Verification's Evolution and Future Prospect

The Responsible Care Verification in this fiscal year has evolved as follows:

◇ As regards verification of activities, revision has been made to review the questionnaire and the assessment criteria at each time of verification. At present, the times of revisions amount to 22 times.

◇ As far as verification of Responsible Care report, it is determined to decide the number of the business places (number of plants) to be examined depending upon the business scale. And for the repeaters the number of dates for examining their head offices was determined to reduce to one day (the amount of the fee is changed accordingly).

Based on these, the following prospect is considered:

◇ In the case of verification of the report, direct talks with factory people can be had, and its equipment can be seen. Such information is very contributive when making assessment of Responsible Care activities. The JRCC considers to study to incorporate assessment of activities into the verification of the report in the future.

◇ Responsible Care Verification started with a target of completing undertaking of all member companies for a 3 to 5 years period. How to accelerate the undertakings in the remaining 2 years --- JRCC Responsible Care Center is considering to send DMs to the presidents of the member companies and what not. Your cooperation in this matter should be appreciated.

Verification Examples and Their Utilization

Up to date, verification of the activities has been conducted to the total number of 14 companies, and certain features are found which will become the problems in common with each company. Some of them are shown below, and it is appreciated if you take up any of them for the reference of your company.

First is the point that "Check" in the PDCA cycle is weak. More definitely, check on education/training, and the effect of emergency response training; check on efficiency of risk assessment; and check on the qualification and business of various subcontractors are named. Second is that the breakdown or embodiment from the head office policy to factory's policy/target/measures doesn't go well. Third is insufficient quantification of target. At the factories which acquired ISO14001 Environmental Preservation is fairly well taken care of compared with other fields. But, the Responsible Care Verification assesses system operation from different view point from ISO14001, and as a result, some undertaken companies are likely to have had an impression of "Responsible Care Verification is harder than ISO14001." The JRCC takes these as the features of the Responsible Care Verification, and for the purpose of giving appropriate advice to the undertaking companies for improving their Responsible Care activities the JRCC will proceed with further improvement of the verification toward the future.

As far as the undertaking companies are concerned, it is recommended for them to understand that the object of the verification does not lie in acquiring high assessment points, but lies in acquiring appropriate advice, and active undertaking of the verification and utilization of the results are expected.

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. Especially, an introduction of member's best practice, stories of personal experience to cope with troubles at small groups within the members, and setup of the places of frankly speaking with each other on the suspended problems have been contributive to leveling up each member company's Responsible Care activities.

Member Experience Exchange Meetings

Spearheaded by the Member Exchange Working Group, the JRCC held in July 2003 in Tokyo (participants: 100) and in February 2004 in Osaka (participants: 80), Member Experience Exchange Meetings as forums for information sharing and members' good practice exchanges.

In fiscal 2003 Process Safety and Disaster Prevention was selected as the main theme, a lecture of accidents of Process safety/Disaster prevention and a panel discussion jointly mixing several persons from the member companies were held, respectively.

The lecture was on the theme of "Learn by the failure/Examples of failure in the chemical field and its utilization" given by Professor Masamitsu Tamura of Tokyo University. He talked about ①Background of accidents and the purpose of data base utilization, ② Object of the examination, ③ An outline of the examination, ④ Problems hereafter, etc. and appealed to the audience about the importance of collection and analysis of information about potentially dangerous minor incidents.

After the lecture, at the Tokyo meeting, having 3 member companies (Mitsui Chemical, Ube Industries, and Nippon Kayaku) introduce about the accidents taken place within the company in the past, the panel discussion on the subject what learned by such accidents and an exchange of opinions with participants in the meeting were held.

The following opinions were advanced: "Data base is important, however, its making up does not mean finish, but unless maintenance is continued, it cannot be utilized," and "While veterans leave their jobs reaching retirement age, it is of vital importance how to have successors feel sensitivity/sensibility to risk, and how to plant such sensitivity becomes a big issue."

At the Osaka meeting, under the title of "Thinking about recent large-scale process safety and disaster prevention accidents" 4 member companies (Nippon Shokubai, Dow Chemical, Daicel Chemical, and Mitsubishi Chemical) spoke in a free position, followed by an exchange of opinions with the audience. Discussed were the importance of "leakage links to an accident, and absolutely not to cause leakage as well as not to have others cause leakage," the importance of strong consciousness and leadership of managers, etc.

Member Experience Exchange Meeting (Tokyo)

Member Workshops

The JRCC continuously organized 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.

This year the workshop studied about the environmental accounting partly for the explanation of "Environmental accounting for chemical enterprises" which was an outcome of "Environmental Accounting Study Group" launched in July 2002 by 10 member companies within the JRCC. In January 2004 the workshop was held in Tokyo and Osaka, which gathered 230 participants altogether.

At the beginning of the workshop, a lecture entitled "Current status and problems of Environmental Accounting/Aiming at Environmental Accounting useful for enterprise management" was given by Professor Katsuhiko Kokubu of Kobe University. Such explanation was made that the object of Environmental Accounting consists of internal control and dispatch of information to the outside, and an introduction of material flow cost accounting contributes to internal control/environmental management.

After the lecture, an interpretation/explanation of the Guideline was made by the members of the Environmental Accounting Study Group. Allotting portions such as Purport of making the guideline, Cost relation, and Effect relation, after the explanation was made, a place was set up for raising questions and an exchange of opinions; examples of model calculation attracted many questions and requests, and future problems have risen to the surface.

Member Workshop (Lecture by Professor Kokubu)

Member Experience Exchange Meeting (Osaka)

JRCC Activities (International)

Intending to contribute to each ASEAN country's "Sustainable development of the chemical industry," the JRCC has been carrying out several Capacity Building activities. Introduced below are the activities regarding pervasion of Responsible Care and GHS.

Capacity Building

Pervasion of Responsible Care

The JRCC has been supporting, since fiscal 2001, Responsible Care activities of ASEAN countries. In fiscal 2003, the JRCC implemented the 2nd time of the Philippine Responsible Care support project which started in 2002. The contents supported are seminar and the verification of individual enterprises. At total 4 days' seminar, after lectures were given on "Ethics of Responsible Care," "Risk assessment," and "Building of Responsible Care management system," understanding was deepened at the Workshop. As regards verification of individual enterprises, follow-up of 3 undertaking enterprises in the previous fiscal year and the verification of newly undertaking enterprises were conducted. This project is planned to continue further.

In July 2004, at Vientiane, Laos, ASEAN Chemical Experts Meeting(AMEICC/ WGCC) was held for an exchange of information and opinions regarding chemical substances management in each ASEAN country. On the previous day, upon request of Laos government and local enterprises, the JRCC held a seminar on Responsible Care.

At the 1st part of the seminar, under the title of "Chemical Safety Management and Necessity of Responsible Care (What is RC?)" the essence and features of Responsible Care including its historical details were explained. At the 2nd part, under the title of "Responsible Care Action in Japan" Responsible Care activities in Japan were introduced. At the 3rd part, entitled "Issue on Promoting Responsible Care," an explanation was made, in accordance with Responsible Care Code, about how to develop Responsible Care, and what are the key points of management system operation. And, after the ASEAN Chemical Experts Meeting, Myanmar and Cambodia requested for Responsible Care support such as holding seminars to Ministry of Economy, Trade and Industry (METI) and the JRCC.

There exists a system of AOTS (The Association for Overseas Technical Scholarship) which, under the support of METI, receives overseas trainees in Japan and gives them education and training. The JRCC has participated in the AOTS training since fiscal 2001 up to now 6 times to ASEAN countries as an introduction of Responsible Care. In October 2004, for an introduction of JCIA's activities, and an introduction of GHS as well as under the title of "What is RC?" the same seminar as given in Laos was held. At the Responsible Care seminar, the workshop that assumed questions on Responsible Care were examined by groups and answered was tried, which considerably won popularity.

Responsible Care Seminar held in Laos

Pervasion Activities of GHS

GHS is an abbreviation of Globally Harmonized System of Classification and Labelling of Chemicals, and translated into Japanese to mean as "World harmonized system regarding classification and marking of chemicals." This means a system to classify chemical substances on the basis of the kind and degree of risk harmfulness in accordance with the rule unified worldwide, and to show in labels as known to anybody or to provide as safety data sheet, such information of chemical substances' hazardousness. It was adopted in 2003 at the UN Economic and Social Council as the resolution concerning implementation of GHS. UN determined its worldly implementation target as year 2008, and it is thought that many countries will introduce GHS. By adopting GHS, developing countries will make their handling of chemical products more appropriate, which will lead to protect human health and safety as well as to raise living environment. In addition, it is expected that adoption of GHS will enable smooth international trade and contribute to development of economy.

The JRCC and Japan Chemical Industry Association, for the Capacity Building (one of the UN terminology, and being translated as "Strengthening of tackling ability," "Development of ability," etc.) of GHS, made original teaching material, and at the same time have dispatched lecturers to various projects and lecture meetings stated below.

JETRO (Japan External Trade Organization)

From fiscal 2003 GHS support program to developing countries started. The object countries are Thailand, Indonesia, Vietnam, Philippines, Malaysia, etc. and the program consists of 2 parts of seminar and workshop. Seminar aims, as its object, at introducing the real state of things of the establishment of GHS including its historic background to not only chemistry-related persons but also as many people as possible.

At the workshop, on the other hand, making primarily chemical substances specialists, and related government officials as its object, at a small number of participants lectures with technical and practical content are given. Following last year's beginners' class Course (1 day course), middle class course (for 2 days) are set up this year. Taking as in the end the trainees will "become leaders of GHS introduction and pervasion in each country," in the next fiscal year upper class course is planned to be set up.

AOTS (Inc. Foundation) the Association for Overseas Technical Scholarship

AOTS started one training course with a curriculum specialized in GHS, making one of the two training courses receiving overseas trainees in a year. The JRCC cooperates in this course with providing material and dispatching lecturers.

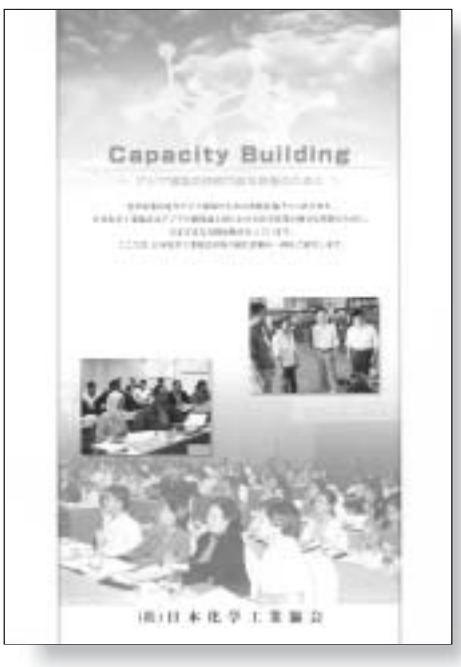
ICETT (Inc. Foundation) International Center for Environmental Technology Transfer

ICETT is also likely to add GHS to its curriculum and the JRCC dispatches lecturers to this also.

These movements have been publicized as a pamphlet entitled as "Capacity Building -for Asian countries' sustainable development -." (Photo left below)

This pamphlet also appears in the "document display" column of the JCIA's homepage.

http://www.nikkakyo.org/document_display_jp.php3?documentid=1374



Glossary of Terms

● APRCC (Asia Pacific Responsible Care Conference)
Under APRO being held biennially.

● APRO (Asia Pacific Responsible Care Organization)
Secretariat of APRCC. 12 countries such as Japan, Australia, Thailand, etc. participated. Mr. Tanaka, the JRCC's head of Secretariat assumed the office of vice chairman.

● CSR (Corporate Social Responsibility)
An enterprise's social responsibility. This concept was born from the way of thinking that an enterprise should positively face to consumers, employment, environment, and local community. This has many portions in common with Responsible Care activities which chemical enterprises have already been implementing.

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

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

● 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.

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

● 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.

● PDCA Cycle
PDCA is an abbreviation for Plan, Do, Check and Action, 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.

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

● 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.

● REACH (Registration Evaluation and Authorization of Chemicals)
Chemical substances control studied in Europe. Refer to page 18.

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

● 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).

● 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.

● Chemical Recycle
To add heat and pressure to polyester fiber product, resins such as PET bottles, and chemical products, and analyze finely to the molecule level, and to reuse it.

● Product Stewardship
The activities to provide information and give education, etc. at the downstream area of chemical products (distribution, selling, and post-use disposal) for the purpose of reducing the influence to human and the environment.

JRCC Members List

Total 110 companies in alphabetical order as of October 2004

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.
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 Chemical Co., Ltd.
Hokko Chemical Industry Co., Ltd.
Idemitsu Kosan 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
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 Highpolymer Co., Ltd.
Showa Tansan Co., Ltd.
Sika Japan Ltd.
Solutia Japan Limited
Sumika Bayer Urethane Co., Ltd.
Sumitomo Bakelite Co., Ltd.
Sumitomo Chemical 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.

レスポンシブル・ケア®

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