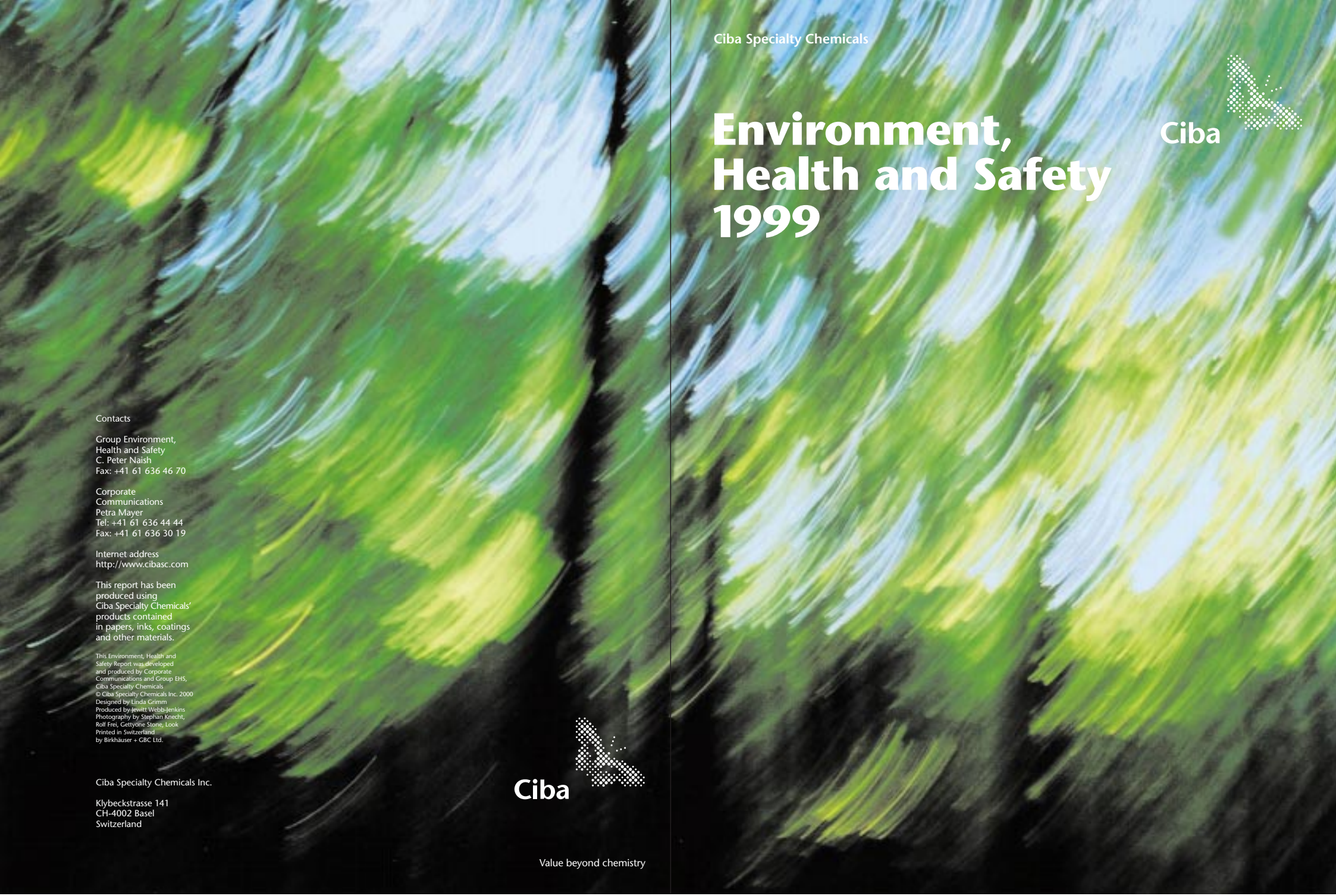

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Ciba

Value beyond chemistry

Ciba Specialty Chemicals

Environment, Health and Safety 1999

Ciba

Environment, health and safety policy

Ciba Specialty Chemicals strives to maintain a leading position in all its markets and business segments. An important element to ensure business leadership is the successful integration of EHS management into all relevant business processes.

We will focus on Product and Process Innovation, Supply Chain Management and Customer Support to improve continuously the EHS performance of our products and services.

We are committed to exploring all reasonable opportunities to apply our EHS strategies and policies in close cooperation with our customers and suppliers for the benefit of all parties.

Ciba Specialty Chemicals is committed to:

- integrating EHS management into business processes and strategic planning
- global compliance with laws, regulations, international treaties and conventions
- minimizing, managing and communicating all risks relating to its products and operations; participating in Responsible Care© programs in all major regions
- maintaining a high level of awareness, motivation, training and professionalism in EHS for all employees
- continuously improving EHS performance through goal-setting and measurement
- considering EHS performance as a key element in selecting suppliers, distributors and contractors
- communicating EHS strategies and performance openly and consistently to all key stakeholders.

Ciba Specialty Chemicals
Environment, Health and Safety 1999

Ciba Specialty Chemicals (SWX:CIBN) is a leading company dedicated to producing high-value effects for our customers' products. Our specialty chemicals, added in small quantities, enhance the performance, look and feel of the final product. Business success is driven by our long-term strategy of innovation and continuous operational improvements. Ciba brings new and creative thought to the processes and products of our customers in more than 117 countries.

Financial Highlights*

	1999	1998
Sales (CHF M)	8 972	8 423
Operating income** (CHF M)	790	877
Net income** (CHF M)	325	369
Operating cash flow** (CHF M)	1 277	843
Total net assets (CHF M)	10 881	10 501
Capital expenditure (CHF M)	292	459
R&D expenditure (CHF M)	305	304
Earnings per share (EPS)** (CHF)	4.89	5.57
Proposed dividend per share (CHF)	2.00	2.00
Shareholders' equity (CHF M)	3 685	3 293
Average number of shares	66 454 357	66 293 130
Registered shares	72 130 117	72 130 117
Number of employees	23 189	24 456

*Presents the Company without giving effect to the pending sale of the Performance Polymers business.
**Before restructuring and special charges.

EHS Awards 1999

Meadowvale, Canada
Significant Contribution Award by Occupational Health and Safety Magazine

Panyu Guangdong, China
Good Housekeeping Award

Pudong Shanghai, China
Fire Protection Bureau Fire Fighting Team Excellence Award
Public Police Station Safety and Security Excellence Award

Takarazuka, Japan
Letter of Appreciation from Miyuku Town Community

Paisley, UK
Chemical Industries Association Safety Award
Chemical Industries Association Gold Award
Royal Society for the Prevention of Accidents Gold Medal and Safety Award

Newport, USA
EPA Storm Water Program Excellence Award

Tarrytown, USA
Star Site under OSHA (Occupational Safety and Health Administration) Voluntary Protection Program

A message from our Chairman and CEO

Rolf A. Meyer
Chairman of the Board
and Chief Executive Officer

Ciba Specialty Chemicals faced a difficult industry environment at the beginning of 1999, which only started to recover in the second half of the year. Within our aggressive and successful initiative to improve profitability and cash flow we held on to our firm belief in the importance of good Environment, Health and Safety (EHS) practices. I would like to thank all our employees for their high personal commitment and contribution, particularly in what has been a period of pressure on the Company and on the industry in general.

The solid business sense of good EHS practices was again reinforced last year:

- We made significant savings from our EHS activities, for example in process improvements, and these contributed to our operational performance.
- We received the best achievable rating, AAA, in Innovest's Eco Value 21 index, a widely-published chemical sector report to the financial community.
- We are also well-placed in the market as demands for new products that provide environmental solutions for our customers continue to increase.

The market for environmentally friendly products such as solvent-free powder coatings is growing by 6-10% annually and, with our wide range of products such as pigments, stabilizers, corrosion inhibitors and photoinitiators, Ciba Specialty Chemicals is well positioned to take advantage of this and other growth areas.

We continued to make good progress in improving our EHS performance in 1999:

- Energy consumption fell to 1997 levels, while production increased by nearly 7%. We are well on our way to reaching the target ratio of using 10% less energy per ton of product than in 1997 by the end of 2000, but further efforts will still be needed.
- The second outstanding achievement has been the reduction in water consumption by 10% during 1999 that resulted from the joint efforts of almost all major sites.

Our safety record for 1999 again shows substantial improvements. I have made safety a personal priority and 1999 was announced as the year of process and personal safety. Through improved risk analysis, comprehensive reporting and investigation of incidents and accidents as well as thorough dissemination of the lessons learned, we reduced lost time accidents by 44% in the last year. Nevertheless, personal safety must stay a number one priority and our objective must be to have zero accidents. I also want to offer special encouragement as well as my personal support to those sites that exceeded our Company average.

Whereas many countries maintain statistics only on accidents which result in 3 or more days lost time, we believe that every accident must be avoided, so we include all lost time accidents in our statistics. As a result, our company rate of 9.4 accidents per 1000 employees is not strictly comparable with the national occupational accident rates of 21.9 per 1000 employees in Switzerland or 5.2 per 1000 employees in Great Britain. Leisure time accidents cause considerably more lost time than occupational accidents and we will be starting pilot programs to reduce these in selected sites in the near future.

Tragically we experienced a fatal accident last year and my sympathies and those of all employees are with family and friends.

The steady rise in zero accident sites since 1997 is additional reinforcement of our solid reputation in employee health and safety. I would like to congratulate the employees of all 22 sites that achieved a zero accident performance in 1999. Furthermore, I would like to applaud all operations managers for the substantial reduction in lost time incidents and, last but not least, all employees at the numerous Ciba Specialty Chemicals sites which received external EHS awards or recognition for their excellent performance in 1999.

In three years of operations, Ciba Specialty Chemicals has implemented EHS thinking in all business areas, from developing new products to improving processes, as well as maintaining and raising the already high health and safety standards. I know that we have the people and the commitment to continue on this track for 2000.

Rolf A. Meyer

Challenges for the new millennium

Hans-Ulrich Müller
Executive Vice President
Law and Environment

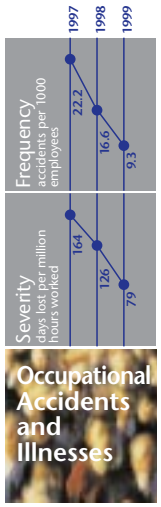
Peter Donath
Global Vice President
Environment, Health and Safety

In the field of environmental protection, health and safety (EHS), we can report a number of significant improvements in 1999:

- With our SEEP reporting program, we now collect EHS data on a total of 68 sites, representing almost 98% of our activities the world over.
- We have taken a major step towards reaching our target to reduce energy consumption by 10% by the end of 2000.
- The MUA programs (Material Use Accounting) launched in all large US facilities have produced impressive results within a short time. In two facilities of the Water Treatment Business Unit, for example, material loss was reduced by 3 000 metric tonnes, which meant savings of just under 10 million Swiss Francs, as well as a reduction in the emissions to the environment.

A particularly important fact is that globally we have almost halved the number of lost time occupational accidents in 1999. A great deal of effort has been expended in the sites and the number which reported zero lost time accidents last year rose to 22. To underscore management's commitment to reducing accidents, an obligatory scheme to notify the CEO and Divisional Heads of all lost time accidents was introduced in February 1999.

Our efforts were however marred by the explosion in a wastewater treatment vessel at our Grenzach plant that tragically caused the death of an employee. We immediately reacted to this accident by intensifying the review of our risk analyses at all major synthesis locations. The campaign is being supported by a special EHS unit manned by experienced experts. They support the plants by training and coaching teams and plant managers and through their involvement in new projects. The activities of this "Risk Analysis" task force were confirmed for a further two-year period until 2002 by our Executive Committee. To further reinforce our activities, we have invited safety managers of the production facilities to attend a three-day workshop in Basel in June 2000. Based on an analysis of incidents and accidents in our company and other firms in the industry, a joint approach to the further development of risk analysis will be made.



An obligation we have taken over from our predecessors is the responsibility for contaminated sites, in particular the contamination of soil and groundwater on our sites or in landfills used by our predecessors. Together with the authorities, our experts are initiating the necessary investigations to evaluate possible risks. At the present, we are not aware of any acute risk from disused landfills or disposal areas on our sites. This applies also to the Bonfol landfill in the Swiss Canton of Jura and to several disposal sites in the Basel region which were used by the chemical industry in the 1950s and 1960s.

A full-scale remediation study for our plant at Toms River in the United States was prepared in February 2000 for appraisal by the National Remediation Board of the US Environmental Protection Agency EPA. During the second half of 2000, we expect to receive the decision on which of the proposed remediation methods is to be applied.

In addition to these activities which relate to the past, we are – as we stand at the threshold to the new millennium – working to shape the future. We are convinced that our future will be determined by our products. We want to make 2000 the year of the product. In addition to continuing our product audit concept in which we evaluate key product lines, Group EHS will, together with the global Research Council, develop a vision defining the specifications for innovative and environmentally-compatible products.

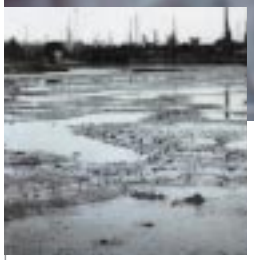
Hans-Ulrich Müller

Peter Donath

Developing advanced products

"We are committed to developing products which help our customers to reduce the impact of their activities on the environment."

Malcolm Hawe, Head of Research and Development, Water Treatments Business, Bradford, UK



Ciba Specialty Chemicals is strongly involved in developing new technologies that clean up existing environmental hazards. Specialists from Ciba's water treatment business have been working for seven years with the Nefrochem oil refinery on Bulgaria's Black Sea coast. Together we developed an application to treat over 500 000 cubic meters of oily sludge which had been accumulated over 30 years. No environmentally acceptable way of disposing had existed before; this method is now used in many other refineries.

Today's strong public demand for products that offer environmental advantages finds Ciba Specialty Chemicals well prepared. When the company was launched in 1997, Ciba published its group-wide Environment, Health and Safety Policy. From this we have developed internal Guidelines which ensure responsible and ethical management of the health, safety and environmental aspects of our products throughout their life-cycle.

These Guidelines have to meet the continuing trend towards stricter legislation. One example is the European Council's directives regarding the use of volatile organic compounds (VOC), including solvents. The largest industry sector using organic solvents is the paint industry which accounts for 38% of all solvents used in Europe. Ciba helps reduce VOC emissions through the development of new aqueous pigment dispersions like Ciba® UNISPERSE® S. Paint producers use UNISPERSE® S dispersions to formulate solvent-free emulsion paints and this water-based approach has already acquired a substantial market share.

The new Ciba® MICROLEN® UA pigment concentrates have been specially developed to provide reliable pigmentation of solvent-free powder coatings. This technology is poised to take over from the traditional wet coating which uses organic solvents. While today most powder coating is done using thermal curing, the hardening of powder coatings with UV light would be a real breakthrough as it would provide tremendous energy savings and also open up new applications for the technology. Ciba is working with partners in the motor industry like BMW to transfer this method from the laboratories to the shopfloor.

Millions of people around the world every year develop skin cancer, and more than 90% of all skin cancers are caused by sun exposure. To protect against harmful UV rays, Ciba is delivering breakthrough solutions, not only by applying UV absorbers to fabrics during manufacturing but also through providing UV protection ingredients for the detergents and fabric softeners used in home laundering.

In another area of product innovation, we help protect the health of the consumer through the use of antimicrobials that prevent the proliferation of germs. As well as the traditional, well-established use in hospitals, Ciba is developing new applications together with customers like OTTO Entsorgungssysteme GmbH, the leading waste container manufacturer in Europe. Together we have developed a household garbage bin made of plastic containing Ciba® IRGAGUARD™ B 1000 antimicrobial. This reduces the development of odor caused by microbial decomposition of garbage and the related potential health risks.

Protecting employee health

In one of our mixing and milling plants at Schweizerhalle, Switzerland, over 100 different solid products are handled. In the past, as a precautionary measure, whenever any of these products were handled openly, extensive personal protective equipment had to be worn. After a workplace assessment and the review of the exposure to dust, a reduction in use of personal protective equipment was recommended in some areas. This resulted in noticeably easier working conditions while maintaining health protection.

"Safeguarding the health of our employees remains one of our first obligations as a responsible company."

Markus Joppich, Senior Occupational Hygiene Expert, EHS Group Basel, Switzerland

It is a primary concern of the company that we provide workplaces that will not jeopardize the health of our employees. This principle is anchored in our EHS Policy; binding Guidelines define measures to be taken to protect, maintain and improve the health of all staff, wherever they work. Group EHS supports these efforts through process risk analysis, exposure evaluation, education, information and the development of health surveillance programs.

Workplace assessment is our primary tool to ascertain the level of health protection and to identify any necessary improvements. It provides information for a comprehensive judgment on health protection in the workplace and checks whether existing technical and personal protection measures are appropriate. If control mechanisms or working procedures are insufficient, then the responsible workplace assessment team defines what is needed to correct the situation and what sort of monitoring program is needed for the future.

Our objective is to safeguard the health of our employees by preventive measures. To achieve this, we need to know as much as possible about the health risks associated with each chemical handled. Therefore all Ciba internal and international occupational hygiene data are collected in our own Corporate Safety and Environmental Database (COSED). This is used to assess occupational health risk aspects as part of the broader risk analysis.

During 1999 we organized occupational health seminars for production managers and supervisors in Europe and the US on subjects as diverse as occupational health management, principle of workplace assessment, occupational disease prevention, exposure assessment, exposure prevention through technical measures, and the possibilities and limitations of personal protective equipment. In order to improve the general awareness of health protection we also carried out practical training programs for operators, paying special attention to the problem of limiting exposure during powder handling.

Exposure to dust requires constant focus, as shown in one of our US plants. Here cases of skin rash were observed by the in-house health service. Medical examination indicated that this must have been caused by an irritant chemical. The rash disappeared after medical treatment and time. A workplace assessment revealed that, during cleanup work after an incident, employees had been exposed to powder residues. The prolonged skin contact combined with perspiration due to increased temperature and humidity was the cause of the observed rash. The specific procedure for cleanup work was revised and the future use of appropriate personal protective equipment has been enforced and instructed. Ever since, no further rashes have been noted.

Towards a safer workplace

A laboratory for determining the fire and explosion properties of raw materials, intermediates and final products was first set up in the UK in 1968. Since then over 7600 different samples have been tested, 450 reactions have been investigated and more than 1200 different thermal stability studies have been carried out. A new purpose-built Safety and Materials Testing Laboratory came fully on-line in January 1999, reinforcing our commitment to the safe design and operation of our plants.

"Anticipation of hazards that can arise when chemicals, people and machines interact is key to successful incident prevention."

Fritz Altorfer, Senior Safety Expert, EHS Group, Basel, Switzerland

Environment, Health and Safety (EHS) management at Ciba Specialty Chemicals has always been based upon three pillars: adherence to EHS standards, implementation of management systems regulating and controlling EHS activities at all levels of the organization, and risk analysis of the chemical or physical processes in all manufacturing and infrastructure units.

We did not meet all our expectations on safety in 1998, so last year was declared a year of process and personal safety for Ciba. The focus was on improving the risk analyses, ensuring comprehensive reporting and investigation of any incidents and accidents and sharing Company-wide any lessons learned. A Task Force was created with the objective of closing the gaps in the quality of risk analysis across Ciba sites world-wide, ensuring a consistently high-level of competence. By the end of 2000, all the risk analyses of the sites will have been reviewed and upgraded where necessary. This is being done by the specialists from the site with support from the Task Force members. So far, the results have been positive with no cases of legal non-compliance found. But we know that improvements to the risk analyses need to be made and these will be addressed in the coming year.

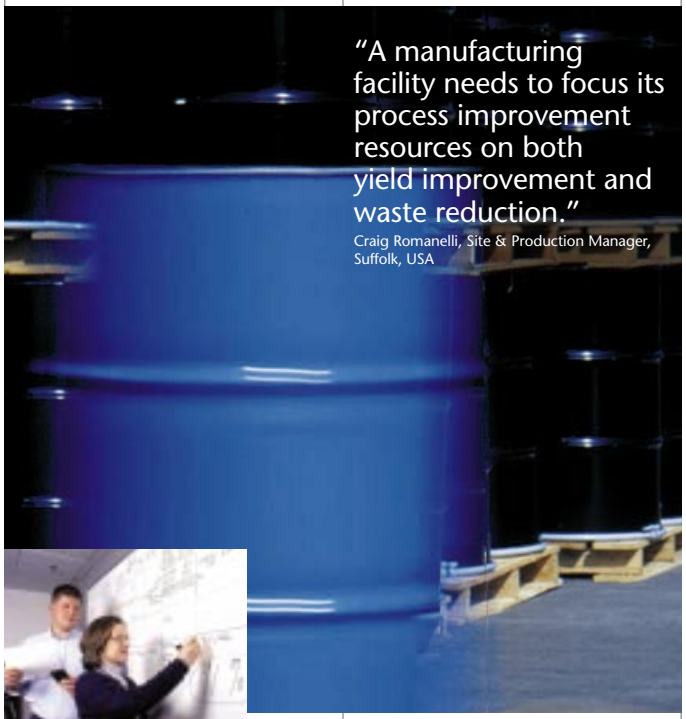
The Safety and Materials Testing laboratories are another building block in the Company's risk analysis activities. Here a range of tests are carried out to ensure control of chemical reactions and to determine fire and explosion hazards. Information gathered in the laboratories is used to develop risk scenarios, for which appropriate measures can be designed. These serve to protect our employees and site neighbors as well as improving the safety of our customers' employees and the consumers.

The Company's own Corporate Safety and Environmental Data system, COSED, also supports the work of our safety experts. This database provides comprehensive information on hazards associated with chemical agents and contains latest data compiled from internal and external experts. It is available globally through the Ciba Intranet.

In 1999 we introduced the TAPROOT® method for the investigation of accidents and incidents. This has been a valuable tool to help us find the real root cause of an accident or incident. The results of any investigations and the lessons to be learned are condensed into a monthly newsletter "Learning from ….", which is widely distributed throughout the Company.

Overall we have achieved a 44% drop in the number of lost time accidents compared to 1998. We will continue all efforts to reduce this number further and to fulfill our commitment to ensure a safe workplace.

Improving production processes



"A manufacturing facility needs to focus its process improvement resources on both yield improvement and waste reduction."

Craig Romanelli, Site & Production Manager, Suffolk, USA

Material Use Accounting has led to outstanding results at our site in West Memphis, USA. In one year, raw material usage reductions have approached 10% and over 30% less waste has been produced as manufacturing outputs remained constant. The Suffolk, USA facility has achieved a reduction of over 50% in the generation of by-products in addition to reducing solvent losses by over 70% within just two months of implementing Material Use Accounting.

Ciba Specialty Chemicals' sites worldwide strive to minimize emissions and wastes from production processes, as well as to reduce resource and energy consumption. Therefore all such processes are periodically reviewed for opportunities to further reduce their environmental impact and to optimize productivity. 1999 saw some impressive improvements, showing that sound EHS practices make good business sense.

In Europe, re-engineering activities provided convincing results, for example in a textile brightener intermediates production process in Switzerland. An alternative production method for Ciba® UVITEX® K led to a reduction of 66% solvents, 70% waste, 20% steam, 50% water, 50% nitrogen and 40% electricity use while at the same time yield has been improved by 5%. In Germany, a change from batch to continuous production of the polymer additive Ciba® IRGAFOS® 168 led to 62% less solvent consumption, 58% less cooling water, 19% less electricity being used, while overall 39% less waste was produced. Additionally, production costs were cut and the yield increased by 5%, all enabling continued cost-competitiveness in challenging markets.

Our Camaçari plant in Brazil made improvements to their plant for the recovery of methanol and isopropanol. Up to 80% of solvent that, until 1998, was emitted to the atmosphere or discharged to the effluent treatment plant and biodegraded, is now recovered and recycled.

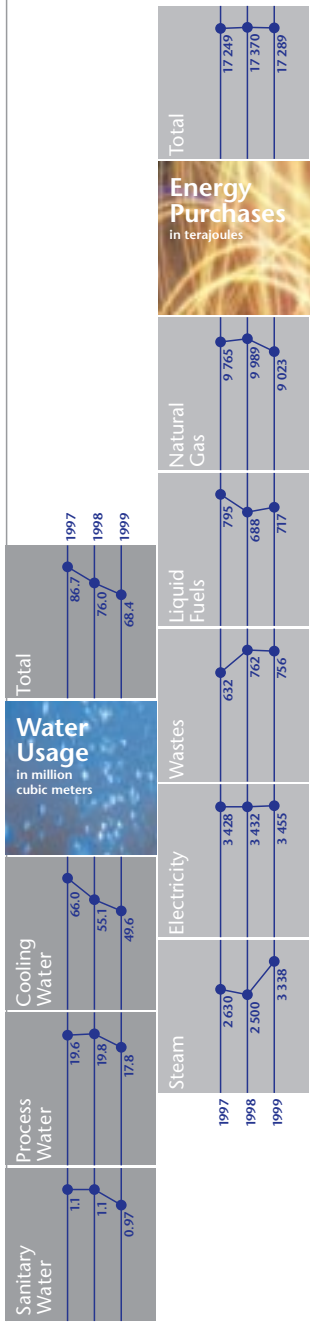
Solvents, energy and raw materials are all valuable resources but water, too, is an important element in many manufacturing processes. In an effort to minimize waste water, our Mahachai plant in Thailand introduced reverse osmosis technology in place of filtration in their production of textile dyes. Use of this membrane technology to separate the dyes from water led to reduced water consumption, increased yield and improved drying performance. Accompanied by an employee awareness campaign and training, this initiative resulted in a reduction of waste water by 49%. Ongoing efforts are now concentrating on possible recycling and effective waste water treatment.

A series of new pollution prevention initiatives was introduced within our Water Treatments operations in the US; these are centered on the concept of Material Use Accounting. This is a material balance mechanism that is used to track incoming raw materials to a manufacturing plant and to determine the effectiveness of converting them to finished product. Waste streams are analyzed in detail and the resulting information is then used to develop and implement process improvement plans, focusing on reducing the waste streams as well as increasing the yield of usable product. Considering that raw material costs account for 40%-60% of the plants' total operating expenses, substantial cost savings can also be realized.

Our ongoing effort to improve our processes is a cornerstone to improving our eco-efficiency.

Our 1999 figures

C. Peter Naish
Senior Environmental Expert



In this our third annual report, the number of sites that submitted data has increased by six. Additionally, the production quantity has risen by almost 7%. Rather than trying to adjust our figures to compensate for these changes, we continue to publish the absolute totals.

Once again we have used our standard reporting scheme SEEP to collect data from 68 sites, compared to 62 sites in 1998. Three chemical sites, two in China and one in India started operations in 1998 and have submitted reports for the first time. One chemical production site in Germany was acquired in 1998 and data from this site for both 1998 and 1999 has been included in this year's report. Additionally two small formulation sites in Malaysia and Singapore submitted reports in 1999 for the first time.

The consolidated data published in this report represents nearly 98% of the company totals. Data supplied by our Joint Ventures has been consolidated to 100% regardless of our holding in the joint venture.

All data apply only to the operations on our sites and do not include emissions or energy consumed by our suppliers in the production of raw materials, intermediates or utilities. We do however report the CO_2 resulting from the electricity supplied to us.

As in the last years, we have followed the recommendations made by the European Chemical Industry Council (CEFIC) in their *Responsible Care*© Reporting Guidelines, but have included additional data on production quantities, water usage and solvent usage.

Production Quantity

Production Quantity is measured in *metric tonnes* and is the quantity of goods shipped to customers. We do not include the intermediates which are further processed, or material shipped between sites. Our production has increased by 6.8% compared to 1997 and 1998.

Energy

We purchase primary energy such as oil or natural gas and secondary energy such as electricity on the open market. Where possible, we cooperate with our neighbors to optimize the joint needs for energy.

For example, we supply energy to each other, so that existing capacity can be optimized. Despite the increase in production, we have reduced energy consumption slightly. The energy efficiency (energy consumption in *terajoules* per metric tonne of product) has improved by almost 7% since 1997. Our target is to increase this efficiency by 10% by the end of 2000.

Water

Water is a most important resource for our operations. We use water for cooling equipment and as a medium in which we carry out numerous chemical reactions. As good quality water is becoming increasingly scarce in many parts of the world, we continue our efforts to use it more efficiently. In the past year we have reduced our water consumption by over 7 million cubic meters. Almost all of our major production sites have contributed to this saving. The reduction represents about 10% of our usage and has been achieved for cooling water, as well as for the process water and sanitary water.

Solvents

Solvents are usually organic liquids; they are the media in which we generally carry out chemical reactions. Usually they do not participate in the reactions, so we try to recover and reuse them and minimize their losses. If the solvents cannot be recycled, they are blended to form a substitute fuel and are burned in special incinerators, producing secondary energy such as steam or hot water. While the quantity of solvent that is used in our plants has remained stable at about 670 000 metric tonnes, efficiency of use has improved as production increased. The amount of solvent purchased to replace the solvent which cannot be recovered and is incinerated, and the solvent which is sold with our products has decreased from 157 000 metric tonnes in 1998 to 146 000 metric tonnes this year. Losses have however increased somewhat but are below the levels reported in 1997.

Terajoule
The joule is the international unit of energy. Terajoule is a trillion (10^{12}) joules or the energy content of about 23 metric tonnes of fuel oil.

Metric Tonne (or Tonne)
1 metric tonne is 1000 kilograms or about 2200 (US or Imperial) pounds.

Responsible Care© Program
Voluntary program set up and run by national chemical industry associations. It gives guidance to companies on their responsibilities towards their employees, neighbors, authorities, environment and other companies. It contains core principles that are the same throughout the world, although the program in each country varies according to the countries needs.

Wastes

The definition of hazardous wastes varies from country to country. We continue to define the following as special or hazardous wastes, in order to achieve uniformity:

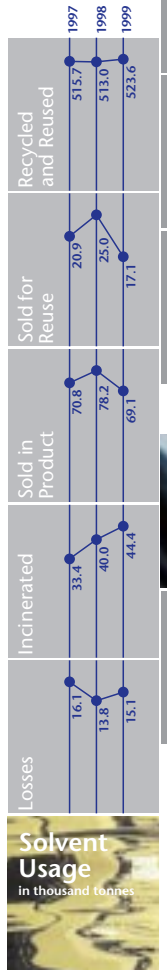
- contaminated excavation and building debris
- used oil
- bio-sludge from effluent treatment plants
- wastes containing mercury
- waste sulfuric acid
- solid and liquid chemical wastes, including sludges and pastes, but not effluents which are sent to drain
- returned, out-of-date and non-specification products
- contaminated packing
- wastes containing asbestos.

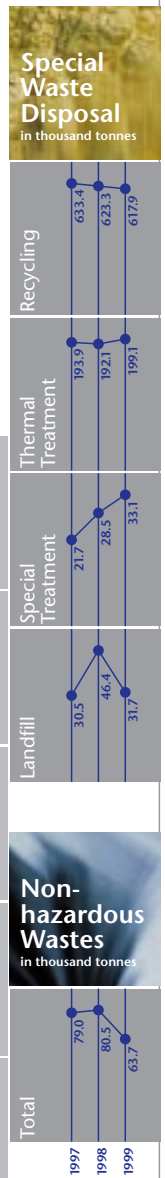
Our sites also generate typical industrial wastes such as scrap metal, glass, paper, wood and cardboard. These wastes are non-hazardous.

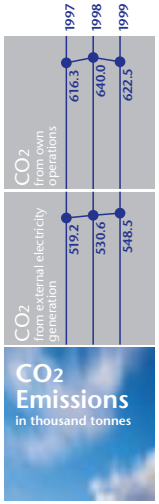
As we predicted last year, the hazardous waste quantity has fallen back to 1997 levels, as 1998 figures were affected by the clean-up of a newly acquired site which was a one-time action. The absolute generation of hazardous waste has fallen by about 1%.

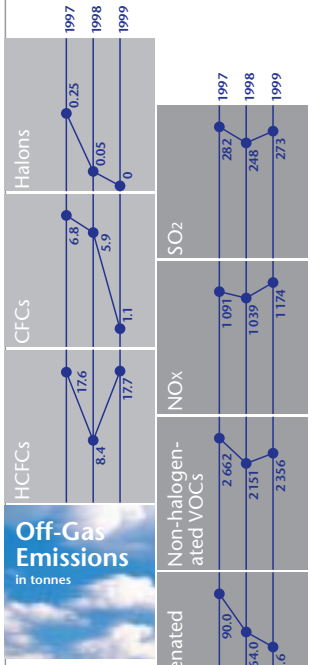
The amount of hazardous waste sent to landfill has been further decreased, which is in line with our policy of minimizing landfill. Due to changes in the product mix, an increasing amount of aqueous waste from one site had to be specially treated, before it could be discharged; this accounts for the increase in the waste going for special treatment.

All sites have made efforts to reduce the quantity of non-hazardous waste resulting in a 20% drop.









Off-Gas Emissions

Carbon Dioxide

Carbon dioxide is a so-called *greenhouse gas* and is believed to be the main contributor to climate change and global warming. Carbon dioxide is formed when fossil (or carbon based) fuels such as oil or natural gas are burned, and we use such fuels to produce stream and electricity in our plants. The generation of CO_2 from our plants has been reduced by about 2.5%, which is in line with our reductions in the use of fossil fuels.

About 20% of our energy consumption is electricity generated by outside suppliers. This electricity generation can also produce CO_2, so we have calculated from the national electricity generating statistics the emissions which could be attributed to electricity we have purchased. These carbon dioxide emissions have risen by 3.4% despite the purchases being constant. The rise is mainly the result of the first SEEP report submitted by our new Chinese production sites. China generates about 70% of its electricity from coal, which produces large quantities of CO_2 per unit of electrical energy generated. Overall the sum of the CO_2 emissions from our activities and attributable to electricity production is unchanged.

SO_2 and NOx

Oxides of sulfur (SO_2) and nitrogen (NOx) are products of combustion of fuel in our incinerators and boiler houses. As the flue gas from incinerators can contain much higher quantities of these gases, they are treated in order to comply with the national emission limits. Emissions from boiler-houses depend on the type of fuel used and the boiler technology. These emissions are much lower and need not be treated.

The bulk of our SO_2 emissions comes from one plant, which does not have access to natural gas. As soon as natural gas becomes available, we will convert to this cleaner fuel. The SO_2 emissions have risen due to the increased energy requirements of this site.

NOx emissions have apparently increased by 13%, but this is mainly due to improved measurements and monitoring of our emissions at two of the sites. We believe there has been no real increase in the emissions.

Volatile Organic Compounds (VOCs)

Almost all the chemical and physical operations we carry out involve organic chemicals, either as raw materials, intermediates, final products or as solvents. Organic chemicals which evaporate easily are grouped together as Volatile Organic Compounds (VOCs). Emissions of these compounds contributes to the problem of photo-chemical smog.

Halogenated VOCs are those VOCs that contain chlorine, bromine or fluorine. These types of compound tend to persist in the environment, as they degrade very slowly. In 1999 we reduced the emissions of halogenated VOCs further. Since 1997, we have achieved a reduction of 40% in these emissions.

We have to report that the emissions of non-halogenated VOCs has increased compared with 1998, although they are

Greenhouse Gases
Gases in the atmosphere which prevent heat reflected from the earth's surface from escaping into space. This causes the global temperature on the earth to rise, just as the temperature in a greenhouse builds up in sunlight.

Halons
Organic chemicals containing chlorine, fluorine and bromine, which are extremely stable. They are frequently used in fire extinguishing systems, especially to extinguish electrical fires. They have a very high potential for destroying the stratospheric ozone layer.

Ozone Depleters
The ozone in the stratosphere acts as a filter against hazardous UV radiation, thus protecting all life on earth. The ozone depleters break down the ozone in the stratosphere and so destroy this protective layer.

still lower than the emissions in 1997 – our base year. The increases are the result of three factors:

- new sites are submitting SEEP reports,
- more comprehensive emission monitoring programs are being introduced and
- production has increased.

Through the continued introduction of new improved processes, we intend to achieve reductions in the VOC emissions.

Dusts

Many of our products are solid in powder form. Their manufacture usually involves such physical operations as drying, milling, grinding, granulation and packaging. Dust emissions could result from all these operations, so we take special care to clean any dust laden air, before it is discharged to the atmosphere. Dust removal devices, such as filters or scrubbers have been installed to ensure that the legal emission limits are complied with. Where hazardousd or highly colored products might be emitted, we frequently exceed the legal emission limits. Dust emissions have risen compared with last year, but are overall at a low level. The rise is caused by the same factors as has affected the VOC emissions.

Chlorofluorocarbons and Halons

Chlorofluorocarbons (CFCs), *Halons* and hydrogenated chlorofluorocarbons (HCFC) are very stable compounds that are used in refrigeration systems and special fire extinguishing systems. CFCs and Halons are known as *ozone depleters*, because they have the potential to break down the stratospheric ozone layer. The use and trade of these products is severely restricted under the Montreal Convention. HCFCs are less critical regarding the depletion of the ozone layer and they are widely used in refrigeration units.
We manufacture none of these classes of substances, but use them in our plants for refrigeration and in fire extinguishing systems.

In 1999 we did not loose any Halons and the losses of CFCs were greatly reduced. Losses of the less critical HCFCs increased, as we used more of this refrigerant in our equipment. We will continue our program to actively seek and eliminate leaks of CFCs, Halons and HCFCs.

Aqueous Discharges

As in previous reports, we report our emissions to water according to the guidelines of the European Chemical Industries Council (CEFIC). We report the loads of different parameters, which are discharged to the different water courses, after treatment of the effluent. To this aim, we have consolidated the actual discharge loads of those sites with their own dedicated treatment plants and for those sites that discharge to joint treatment plants operated by others for neighboring communities and industries, we have calculated our contribution of the loads discharged to the environment.

The methods used to measure various parameters such as organic load, nitrogen or phosphorus can vary from country to country. For clarity, we have converted each into a single parameter.

We are pleased to report, that with the exception of the parameters "phosphorus" and "suspended solids", significant improvements in the quality of the discharged effluent has been achieved. The load of suspended solids discharged has risen by less than the production increase.

We believe that the increase in the discharge of phosphorus compounds is not real, but due to improved sampling and measurement techniques. In some countries, the authorities are asking for more frequent sampling and analysis of the phosphorus in effluent, which leads to an better picture of the total discharge.

The discharge of heavy metals to the surface water has been decreased. We use chromium compounds in the production of certain colors and we continue to improve the processes to reduce the discharge of this metal. The variations in the loads of the other metals are within the accuracy of the sampling and analysis techniques.

In 1999 we have made good overall progess in improving our EHS performance, but believe there is still potential for further advances.