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WORLD ENVIRONMENT CENTER

**ENVIRONMENTAL AND WASTE
MINIMIZATION ASSESSMENT**

VCHZ SYNTHESIA

PARDUBICHE, CZECH REPUBLIC

JUNE 19 TO JUNE 30, 1993

By: John B. Coleman

**WORLD ENVIRONMENT CENTER
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I. EXECUTIVE SUMMARY

Purpose of Trip:

VCHZ Synthesia is a chemical company founded in 1922 and located in Pardubice, Semtin, Czech Republic. The company has applied for a PHARE loan (for privatization), which requires that an environmental audit of the entire facility be performed. VCHZ Synthesia is contracting for two Czech environmental consulting firms to perform a four month environmental audit starting in September 1993.

The management of VCHZ Synthesia requested that WEC provide a Volunteer Specialist to prepare company management for the environmental audit, by conducting a simulated environmental audit to demonstrate what will be required. During the visit, the Volunteer Specialist was also to identify opportunities for improving their environmental conditions using low cost technology, where appropriate.

As an addition to the original purpose, the Prague office of the Czech Environment Management Center (CEMC, see Appendix A of this report for description) requested that the Volunteer Specialist participate in a two day workshop at the Hotel Synthesia in Pardubice. The workshop purpose was to educate representatives of other industrial companies on environmental audit requirements.

Major Findings and Recommendations:

Synthesia has a stated objective of attaining environmental excellence by the year 2000. The 1992 Annual Report lists three priorities, the top two of which reflect environmental considerations:

1. The development of a new strategy with regard to the environment.
2. Improvement of our corporate image.

Corporate senior management of Synthesia is supportive of proactive environmental programs, but it should be noted that the operating divisions (five production areas plus power engineering, maintenance and construction and research) are very autonomous and senior management will need to supply some corporate oversight to ensure consistency of program implementation across the company.

It is suggested the General Director should form an Environmental Leadership Committee including his direct corporate reports and at least two heads of Operating Divisions (see more complete description under the Conclusions and

Recommendations section of this report). That leadership group must provide the continuing drive and oversight to make sure that excellence program goals are set and accomplished in a timely fashion.

To enhance the corporate image with the public, it is suggested that Synthesia consider publishing annually a progress report on their environmental excellence program. The report could highlight the positive things like the new biotreatment plant and the modern hazardous waste disposal landfill and also report weaknesses or deficiencies that need to be addressed. This type report will be particularly timely after year end, when the formal audit results become public knowledge. An example report published by the DuPont Company for 1992 is attached in Appendix A.

The Volunteer Specialist spent most of the plant time in workshops with the corporate environmental management team and with up to eighteen ecologists from operating divisions. Typical audit protocols were reviewed to make Synthesia personnel aware of what an environmental audit is and what data, records, management systems and training documentation will be expected to be reviewed by the auditors(see examples in Appendix A). Protocols reviewed included the pre-audit questionnaire, and specific requirements for air, water, solid waste, underground storage tanks, pesticide use and spill prevention procedures. All participants were attentive and interested in becoming familiar with what to expect when the formal audit begins. It was apparent that the operating areas have a lot of work to do in establishing management systems to ensure area compliance with regulatory requirements, and in improving training of operators on environmental awareness. Actual monitoring of air emissions may need to replace inventory now based on calculations by mass balance. These workshop sessions seemed to be helpful to the corporate group and to the area participants. It was suggested that Synthesia personnel begin immediately developing and filling out the information normally requested in the pre-audit questionnaire. This type information is typically asked for by the consultants preparing to do the formal environmental audit, so Synthesia can get a head start on pulling together the information now. Also, having that information available to share with potential auditors during the selection process may be helpful in defining the scope of the audit.

Plant tour time was limited to visits to the under- construction biotreatment plant, the operating acid neutralization plant, a liquid waste collection and retention pond, and the very modern new hazardous waste disposal landfill.

Synthesia has allocated a high level of investment (68% of total in 1992) to projects for protecting the environment. It was suggested every effort be made to speed up the start of the new biotreatment plant (now scheduled to begin operation in mid-1994), so that direct discharge of waste water to the Elbe River

can be eliminated as soon as possible. It is recommended that Synthesia technical experts consider incorporating the Powdered Activated Carbon Treatment (PACT) process along with the biotreatment micro-organisms to enhance the destruction of contaminants. The PACT process was developed by the DuPont Company and has been used for years at its Deepwater, New Jersey waste treatment plant. DuPont has sold the rights to the technology to Zimpro of Rothschild, Wisconsin. They have been contacted to provide up-to-date information for forwarding to Synthesia.

Overall, Synthesia has recognized the need to improve its environmental performance and is investing in facilities that will help with end-of-pipe treatment. They are also aware of the need to eliminate or minimize waste at the source, back in the process areas. Senior management will need to continue to keep excellence in environmental protection as a high priority. Rapid implementation of recommendations that result from the formal audit later this year will help toward the goal of excellence by the year 2000.

Note: Seven representatives of other companies attended the June 28-29 workshop in Pardubice. Audit protocols were reviewed and there was discussion of other audit requirements.

II. INTRODUCTION

The World Environment Center (WEC) has a cooperative agreement with the United States Agency for International Development (USAID) to provide U.S. private sector expertise to transfer technology and skills to Eastern Europe industry and government representatives so that they can more effectively reduce industrial and urban pollution, improve solid, hazardous, and toxic waste management, improve industrial health and safety practices, improve energy conservation and management, and increase community awareness in environmental and energy related areas.

John B. Coleman, Jr., incorporated as Breen Consulting, Inc., was chosen by WEC staff as the Volunteer Specialist to assist VCHZ Synthesia. Mr. Coleman spent June 21-25 at the Synthesia Plant in Pardubiche, Semtin, Czech Republic and June 28-29 at a Czech Environment Management Center workshop in Pardubiche. A profile of Mr. Coleman's credentials is attached as Appendix F.

III. FINDINGS

1. For description of plant and products, see Appendix E.
2. Several environmental projects are underway and one was completed in 1992:
 - o A new hazardous waste landfill was put in operation last October. This facility meets the latest stringent requirements for protection of groundwater (clay and plastic linings and leachate collection system). There is a computerized truck weigh-in system and manifest and location logging for wastes placed in the landfill. Use of the old dump site has been discontinued, and a remediation program for that area is being considered.
 - o A new 55000 cubic meter/day biotreatment facility is scheduled to start-up mid-1994 (see photographs in Appendix A). This facility will treat industrial waste from the Synthesia operating divisions and the total municipal waste from the city of Pardubiche (100,000 people). A pilot plant demonstrating acclimation of municipal waste bacterial organisms to industrial wastes is in operation now. The project also includes segregation of process and flushing water from rainwater run-off, in all operating areas, to reduce the hydraulic load on the waste treatment plant. There will be an associated incinerator to burn the excess sludge generated in the treatment plant. This total project will eliminate direct discharge of non-treated process waste water to the Elbe River.
 - o Synthesia is also committed to convert the powerhouse from brown coal to black, low sulfur, coal to meet legal and more stringent emission limits by 1996.

Meantime, some existing waste treatment is in operation, including a neutralization unit for acid wastes, a retention basin to control waste discharge to the river, and three incinerators (one for liquid hydrocarbon wastes, one for liquid waste, yes, and a third for flammable and explosive wastes). There has been some emphasis on minimizing wastes at the source, with a 7% reduction of liquid waste since 1991.

Despite these continuing or in-progress programs, operating areas will need to implement improved management systems for maintaining up-to-date inventories of liquid wastes generated and air emissions, for spill prevention, and for waste reduction at the source and for continuous communication with and training for operators, so they understand the need for good practices to protect the environment.

IV. CONCLUSIONS AND RECOMMENDATIONS

1. The General Director should form a corporate Environmental Leadership Council including his Deputies for Strategic Planning, Economics, Commerce and Trade, Personnel and Environment plus at least two heads of operating divisions. This committee should meet monthly and provide environmental leadership and program support to ensure environmental considerations are integrated into all business decisions of the operating divisions. This committee would adopt policies recommended by the corporate environmental group, with input from operating division ecologists. Policies adopted should be communicated to all employees, to enhance implementation of action required by the operating divisions. For example, this Council might recommend a cost system that charges each operating division the allocated cost of disposal of the waste generated by that division, as incentive for those businesses to reduce their waste.

2. The corporate environmental management group should develop a written environmental policy manual (for adoption by the Environmental Leadership Council). This manual should cover:

- o General policy to protect the environment
- o Roles and responsibilities of environmental management and line organization
- o Groundwater protection
- o Management of hazardous waste
- o Use of or elimination of underground storage tanks

3. Operating areas should begin now to fill out the model pre-audit questionnaire provided by the Volunteer Specialist. This will help determine (a) what management systems are not now in place, but are needed and (b) what data or documentation is not now available, but needs to be in existence. This will then allow the corporate environmental group to provide the contract auditors background information for determination of the scope of the audit.

4. Operating areas should put in place management systems to address weaknesses identified by filling out the pre-audit questionnaire, for example:

- o spill prevention control and secondary containment measures
- o actual monitoring of air emissions versus calculations based on mass balance
- o documentation of operator training

5. Synthesia should consider producing a separate annual report covering progress on environmental issues. This would be useful as a communication method to the public as well as to Synthesia's own employees. This document may be particularly important to stem public reaction to the audit results, should they be critical of Synthesia. The report could highlight the positive aspects of the new facilities and new programs being put in place to protect the environment and could also note the value of having an audit, for identifying weaknesses to be corrected. The report would also report progress year-to-year against goals.

6. Operating Divisions should be encouraged by the Leadership Council to set specific environmental improvements goals, such as reductions in air emissions or solid wastes, within a specific time frame. These goals represent Synthesia commitments to improvement.

During the workshop discussions at Synthesia, the Volunteer Specialist covered some essential elements required for a company to achieve environmental excellence. These elements are:

- o Strong top management commitment
- o Working environmental policy
- o Integrated environmental organization
- o Line organization responsibility
- o Aggressive goals and objectives
- o High standards of performance
- o Supportive environmental personnel
- o Comprehensive self-inspections and audits
- o Incident investigations and reports
- o Effective two-way communication
- o Progressive motivation
- o Continual environmental training

Synthesia has made a good start in pursuing its environmental excellence goals and the upcoming formal environmental audit will help identify areas that need additional improvement.

V. APPENDICES

APPENDIX A, #1 - CEMC DESCRIPTION

CEMC Board of Directors

Chairman

Ing. František Hromek, General Director
Vítkovice a.s.

Vicechairman

Ing. Miroslav Nevosad, General Director
Kaučuk Kralupy n/Vlt.s.p.

Ing. Dušan Nepejchal, General Director
Chemopetrol Litvínov s.p.

Ing. Jaroslav Valoušek, General Director ✓
VCHZ Synthesia Semtín s.p.

Ing. Jaroslav Dusílek, president APES

Ing. Jaroslav Borák, Deputy Minister of Industry and
Commerce

Ing. Václav Vučka, Deputy Minister of Environment

Ing. Miloš Paleček, Director
Výzkumný ústav bezpečnosti práce

Ing. Otto Emanovský, Section Director
sekretariát Svazu průmyslu ČR

Tom Zajíček, Chairman
Svaz měst a obcí

Ing. Karel Liška, CSc. Director
Institute of Modern Industry

Doc. Ing. Václav Roubíček, CSc. prorektor

Ing. Radomír Matyáš, CSc., CEMC President ✓

The founders of CEMC:

Chemopetrol Litvínov, Asbestos Zvěřinec, Fatra Napajedla,
Kaučuk Kralupy n.Vlt., Kordárna Velká n.Veličkou, Lučební
závod Kolín, Východočeské chemické závody Pardubice,
Výzkumný ústav anorganické chemie Ústí n.L., Preciosa
Jablonec n.N., Cementárny a vápenky Mokrá, Vítkovice
Ostrava, Poldi - Spojené ocelárny Kladno, GES Ostrava,
Chemoprojekt Praha, Chepos inženýrsko-dodavatelská
organizace Brno, SINDAT Praha, VÚBP Praha, IMP Praha,
Gumotex Břeclav, Optimit Odry, SPOLCHEMIE Ústí n.L.,
CRYSTALEX Nový Bor, Železárný Hrádek, VUOS Par-
dubice, Katedra ochrany životního prostředí VŠCHT Par-
dubice, Silon Planá n.L., Keramoprojekt Praha, DEZA Va-
lašské Meziříčí, Precheza a.s. Přerov, TRIGA-CS Lomnice
n.P., JJ International, spol.s.r.o. Brno, Moravské chemické
závod, a.s. Ostrava, SAGE Brno s.r.o.



ČESKÉ EKOLOGICKÉ
MANAŽERSKÉ CENTRUM
CZECH ENVIRONMENT
MANAGEMENT CENTER

WHO WE ARE,
WHAT WE DO



ČESKÉ EKOLOGICKÉ
MANAŽERSKÉ CENTRUM
CZECH ENVIRONMENT
MANAGEMENT CENTER

Politickýá věžňů 13

110 00 Praha 1,

Tel.: (02) 228796

Fax: (02) 226021

The Czech industry that is undergoing a period of change towards market economy will reach, in addition to its economic objectives, a greater harmony of business and environmental laws by the employment of

- legislation,
- economic tools,
- voluntary activities of entrepreneurs.

By the combination of these factors a course towards sustainable development will be started.

Czech Environment Management Centre (CEMC) is a non-governmental, non-profit and independent corporation. Its mission is to act as a catalyst in:

- increasing management knowledge of environment protection as a business opportunity,
- linking the business and environment protection,
- information transfer to the medium and top level managements,
- implementation of practical and modern approaches,
- know-how, management system and modern technology transfers,
- personnel training,
- application of case studies, methodologies and databases.

CEMC cooperates with

- enterprises,
- the Industrial Union of the Czech Republic, Association of Producers of Ecological Systems, Institute of Modern Industries, Foundation of the Institute of Industry, Association of Technical Diagnosticians, CHISA, World Environment Center, U.S.EPA, International Business in Community, Chemical Manufacturers Association - USA, American Iron and Steel Institute - USA, Citizens Democracy Corps - USA, The Institution of Chemical Engineers - Great Britain,
- universities,
- local authorities
- public.

The strategy of sustainable development is being accomplished by four programmes that consist of individual projects:

Business and environment

- Sustainable development programme
- Environmental audit
- Analysis of the impact of human activities on the environment
- The impact of new valid legislation on the company behaviour
- Domestic and foreign sources for designing and implementing ecological projects
- Public relations
- Responsibilities for environmental damage

Information sources in industrial ecology

- Information resources
- Adaptation of foreign manuals
- Case studies of information sources utilization

Waste minimization

- Waste minimization methodology
- Demonstration projects of Waste Minimization.
- Demonstration programmes in waste management

Safety engineering

- Risk assessment and evaluation in industrial practices
- Identification of hazardous condition by HAZOP methodology
- Diagnostics of industrial equipment
- Safety audit

Within the framework of these programmes, CEMC implemented in 1992 15 projects that can be used in industry and in the decision-making process of top managements and state authorities.

CEMC outputs are as follows:

- information
 - o on information sources
 - o CEMC library
 - o CEMC options bulletin
 - o purpose-made publications
 - o translations of foreign publications
- analyses
- demonstration projects
- methodologies
- case studies
- training programmes and materials
- workshops

OF 1992 PRODUCTS CEMC OFFERS:

Analysis of the impact of new valid legislation in environment protection on the company economy.
Environmental Auditing.
Analysis of the experience from preparation and implementation of projects with foreign participation.
Methodology for the utilization of domestic and foreign sources to design and implement ecological projects.
Catalogue of environment information databases.
Changing Course.
Analysis of the programmes of waste management of selected waste producers.
PROTOCOL on implementation of CEMC project WASTES BOHUMIN
APELL (Awareness and Preparedness for Emergencies at Local Level).
Risk assessment and evaluation methodology.
Utilization of dismantle-free diagnostics to increase the safety of the industrial company.
Safety of industrial complexes and transport of hazardous materials.
Categorization of hazardous plants and processes.

APPENDIX A, #2 - DuPONT COMPANY ENVIRONMENTAL REPORT

10

C O R P O R A T E E N V I R O N M E N T A L I S M

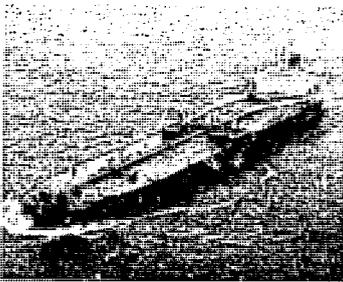
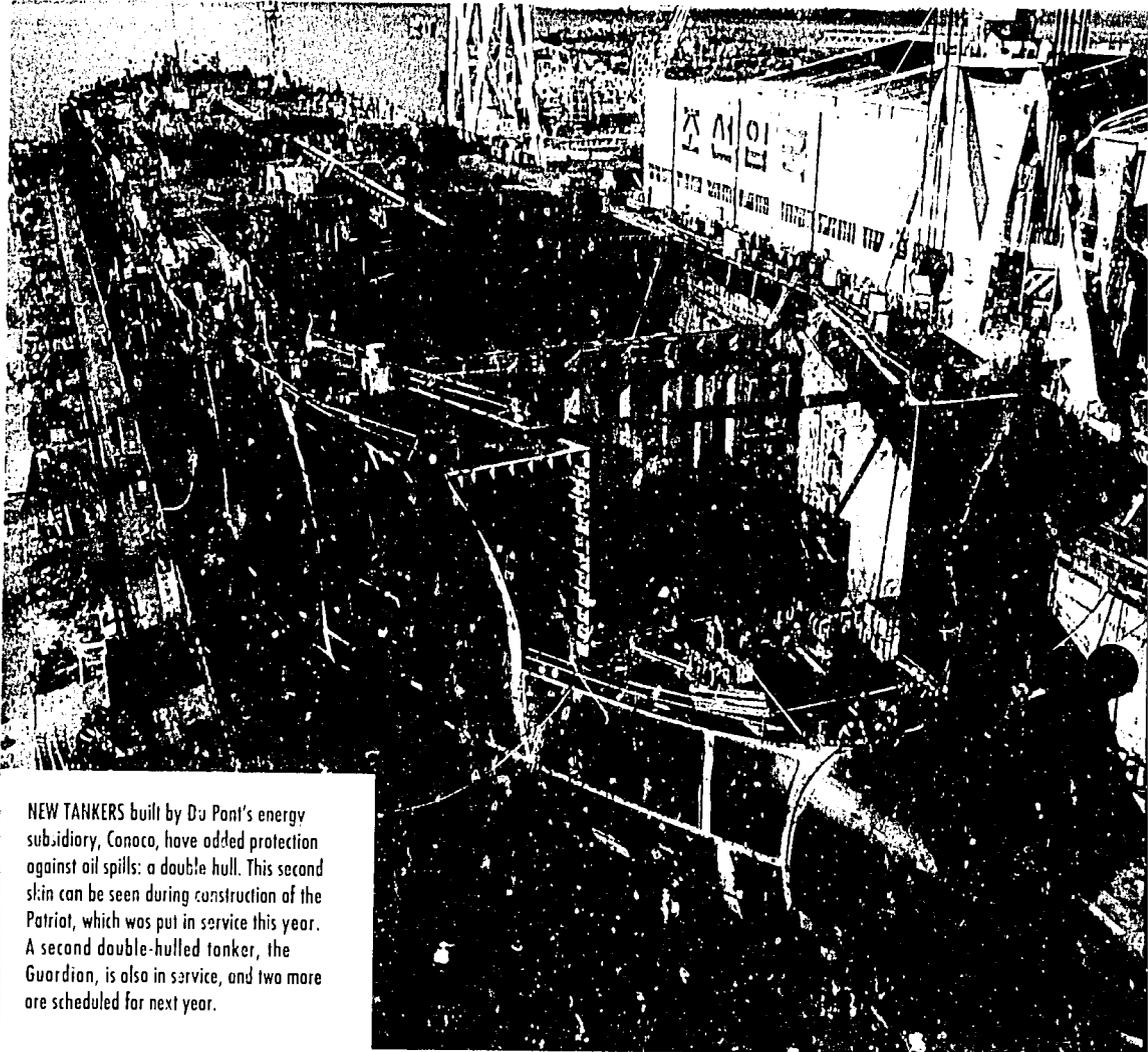
1992 Progress Report



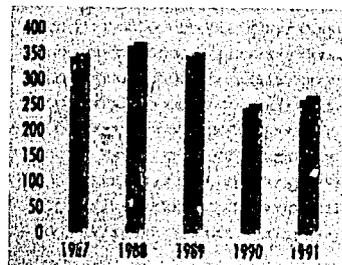
COVER: WILDLIFE benefit from Du Pont's decision to build only double-hulled tankers, which offer extra protection for the environment. Conoco is well ahead of the goal to convert its entire fleet to double-hulled vessels by the year 2000.

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NEW TANKERS built by Du Pont's energy subsidiary, Conoco, have added protection against oil spills: a double hull. This second skin can be seen during construction of the Patriot, which was put in service this year. A second double-hulled tanker, the Guardian, is also in service, and two more are scheduled for next year.



DU PONT CHEMICALS & SPECIALTIES



U.S. CHEMICAL INDUSTRY

RELEASES and transfers of some 300 chemicals in the United States are reported annually to the Environmental Protection Agency. For comparison purposes, the above charts show the TRI as reported from 1987-1991, without adjustments. Du Pont's inventory is shown on page 10, with adjustments to compensate for new listings and deletions and to reflect better the real progress from year to year. The Toxic Release Inventory is the only comparable, multi-company public accounting of environmental releases. The above numbers are in millions of pounds. The U.S. chemical industry figure was not available for 1991.

FROM THE CHAIRMAN:



Three years ago, Du Pont committed to new standards of environmental performance that include specific, measurable goals and the requirement for public disclosure. The last two corporate Annual Reports documented progress towards the goals, and this booklet gives a fuller accounting. ■ In candor, there are positives and negatives to report. On the plus side, we are making strides towards our environmental goals. Many pollution indicators are coming down from their base-year levels — hazardous waste, air toxics, air carcinogens and the Environmental Protection Agency's voluntary 33/50 chemicals. At the same time, we're reviewing our environmental programs to see how we can move farther and faster. ■ One important indicator, EPA's Toxic Release Inventory, went up in 1991. The upturn was due to an increase in the disposal of dilute waste in EPA-permitted deep wells. The company is committed to eliminating toxic discharges to the ground by the end of the decade, and has mounted a major research program to this end. Until the objective is reached, however, Du Pont is likely to remain near the top of EPA's TRI list. ■ Again on the plus side, the company continues to make strides in product stewardship. The phase-out of chlorofluorocarbons (CFCs) is a case in point. Production is falling, the availability and adoption of alternatives are increasing, and the industrial world is moving quickly and orderly to products that have little or no impact on stratospheric ozone.

Other examples include:

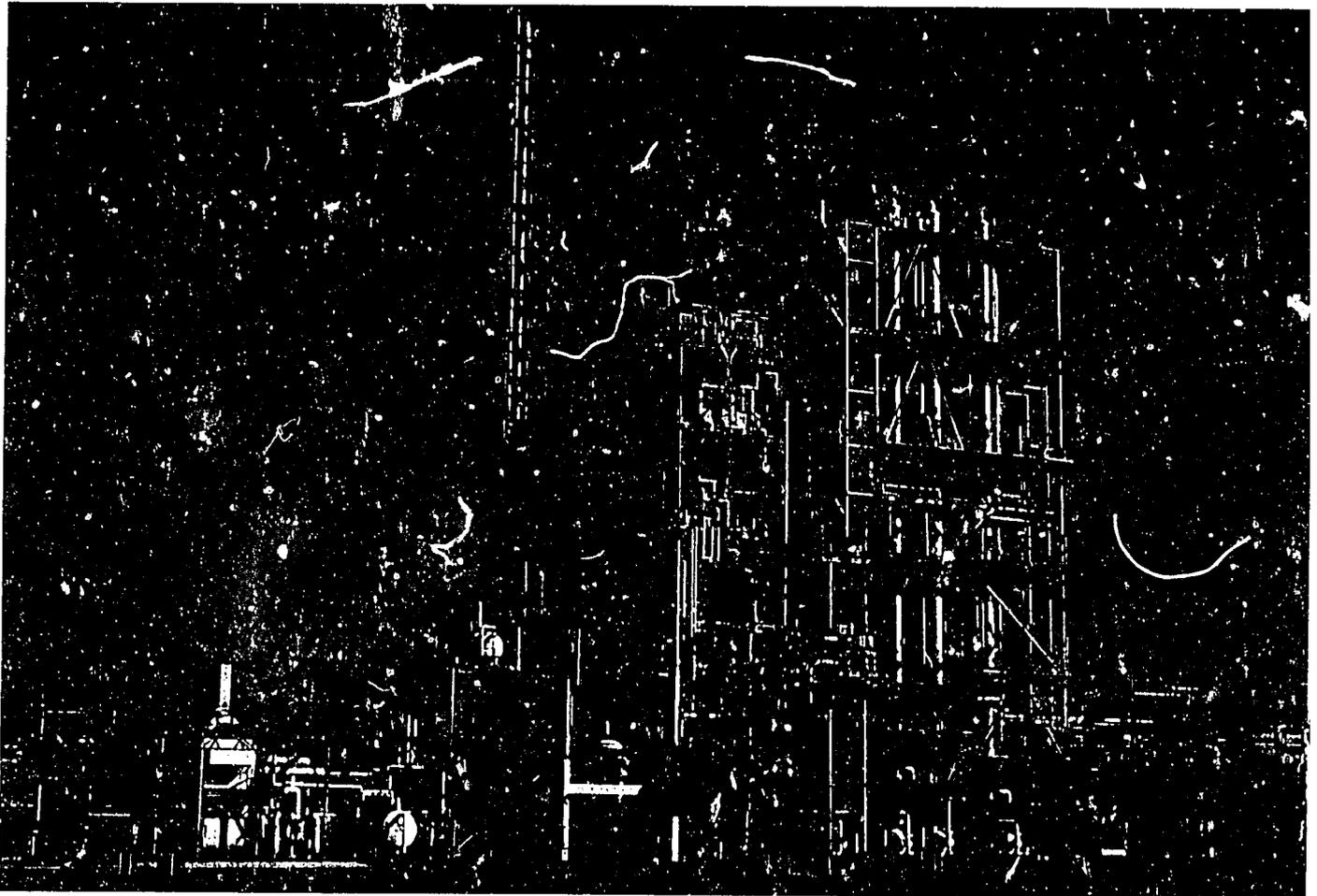
- Recycling a billion pounds of plastics in 11 industrial recycling plants.
- Providing environmental services, including remediation and reclamation, to customers for chemicals, photographic products and electronic materials.
- Developing agricultural products and practices that offer targeted crop protection and have no adverse impact on the environment.
- Introducing alternative, cleaner automobile fuels at the pump.

The environmental job is big and costly. This year Du Pont will spend \$1.3 billion for capital investment and operating expenses, including funds for remediation. Since 1988, the company has accrued over \$600 million to cover the costs of certain remediation activities and spent about \$190 million. ■ Du Pont is a party in more than 100 Superfund sites on the federal National Priority List and additional sites identified by state environmental agencies. The company spends \$5-10 million a year in settlements to clean up these sites, and pays Superfund taxes totalling \$30-35 million per year. ■ Environmental laws and regulations are increasingly complex, and the Environmental Protection Agency and the states are stepping up enforcement. In 1991, the company paid 65 fines and penalties, mostly for administrative violations. This certainly falls in the minus column, and we are working hard to eliminate all incidents, including those that can lead to fines and penalties. It is encouraging that a new internal reporting system for plants to monitor inadvertent spills, leaks and releases shows a reduction in the number of incidents from the base year of 1991. ■ In 1992, we added a board-level committee and restructured our environmental operating management, moving it closer to the business units. We are using "Responsible Care" and other industry-wide environmental management codes to drive and guide our efforts. We have a new, formal auditing process, which included for the first time in 1991 an evaluation of the process, plus oversight audits, by an outside environmental firm. As expected, the outside review found strengths and also made recommendations for improvements, which are being implemented. The audit's Executive Summary is printed on pages 14-15. ■ Finally I would tally on the plus side that we are willing to listen — at corporate headquarters, in business centers and at plants, 30 of which have Community Advisory Panels — and to change. We have tried to lay out the facts in this report, to establish a baseline for measuring progress and to recognize the need for improvement. This is our first environmental report, and we look to improve the data base and our presentation in future reports. ■ We welcome your comments and questions. Please use the reply card or direct them to "Corporate Environmentalism," Du Pont External Affairs, Wilmington, DE 19898.

E. S. Woolard Jr.

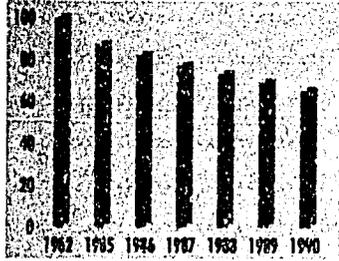
E. S. Woolard, Jr., Chairman

PLANTS to produce "Suva", Du Pont's family of refrigerant alternatives, are being built in Canada, Japan, the Netherlands and the U.S. (pictured). The company forecasts to spend \$1 billion by the year 2000 for research and new plants to make CFC alternatives.

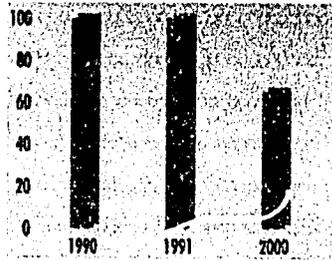


Du Pont is committed to several environmental goals, which have been made public, added to, achieved and revised over the years. Progress is shown in these pages towards goals related to hazardous waste, energy, the production of chlorofluorocarbons, toxic air emissions, carcinogenic air emissions, EPA's 33/50 chemicals, and land toxics. Three of the measures presented are based on the Toxic Release Inventory, adjusted to make year-to-year comparisons meaningful (see page 10). As the company improves its environmental reporting, our objective is to include more than just the wastes and emissions listed by EPA. In addition to the goals depicted here, Du Pont is on record to reduce greenhouse gases, specifically nitrous oxide; to assess groundwater at company sites and develop any necessary protection plans; to manage company land for wildlife enhancement; to build double-hulled oil tankers; to install additional environmental protection for underground tanks at gasoline outlets; and to intensify the development of cleaner fuels.

G O A L : To reduce hazardous waste, as a unit of U.S. chemicals production, by 35% from 1982 to 1990; and to reduce hazardous waste¹ from the manufacture of chemicals worldwide, not indexed to production, by 35% from 1990 to 2000.



UNITED STATES INDEX (1982=100%)

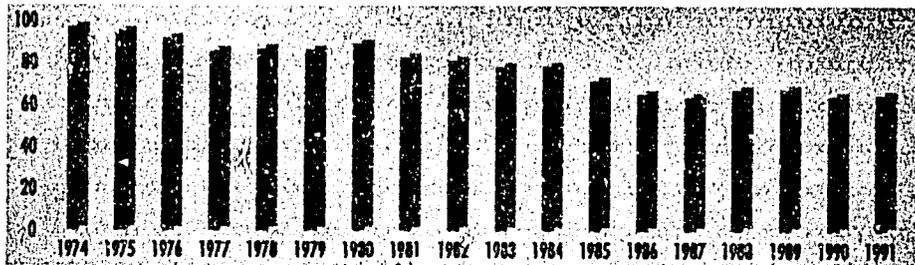


WORLDWIDE INDEX (1990=100%)

HAZARDOUS WASTE REDUCTION

¹Hazardous waste includes waste identified as hazardous by applicable legislation or regulation or by Du Pont's toxicity characterization, plus any waste, hazardous and non-hazardous, that is disposed of in deepwells.

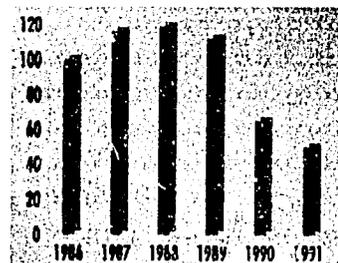
G O A L : To improve energy use continuously, as measured in BTU's per pound of finished product.



ENERGY CONSUMPTION (per unit of production)
(1973 = 100%)

¹Du Pont expects that this goal will result in a 15% reduction by the year 2000, relative to 1991.

G O A L : To phase out production for sale of chlorofluorocarbons (CFCs), as soon as possible but no later than year-end 1995 in developed countries.

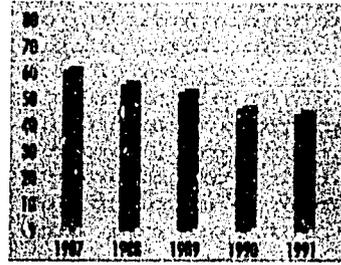


CFC PRODUCTION INDEX (1986=100%)

¹ Production as defined by the Montreal Protocol.



G O A L : To reduce toxic emissions to the air from U.S. sites by 60% from 1987 to 1993, and at sites in other regions by 10% per year from 1990 to 1993.

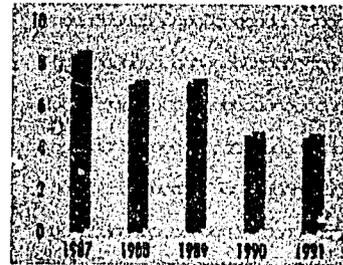


U.S. AIRBORNE TOXIC RELEASES (millions of pounds)

Source: Toxic Release Inventory, excluding annual deletions and additions (see page 10).



G O A L : To reduce carcinogenic air emissions by 90% from 1987 to 2000 at U.S. sites and by 90% from 1990 to 2000 at sites in other regions.

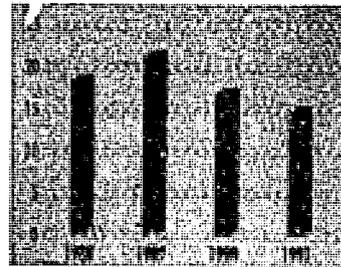


U.S. AIRBORNE CARCINOGENIC RELEASES (millions of pounds)

Source: Toxic Release Inventory.



G O A L : To reduce emissions of 17 large volume toxic chemicals identified by EPA, by 50% in aggregate from 1988 to the end of 1995.

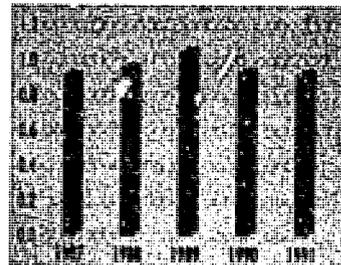


RELEASES OF 33/50 CHEMICALS (millions of pounds)

Source: Toxic Release Inventory.

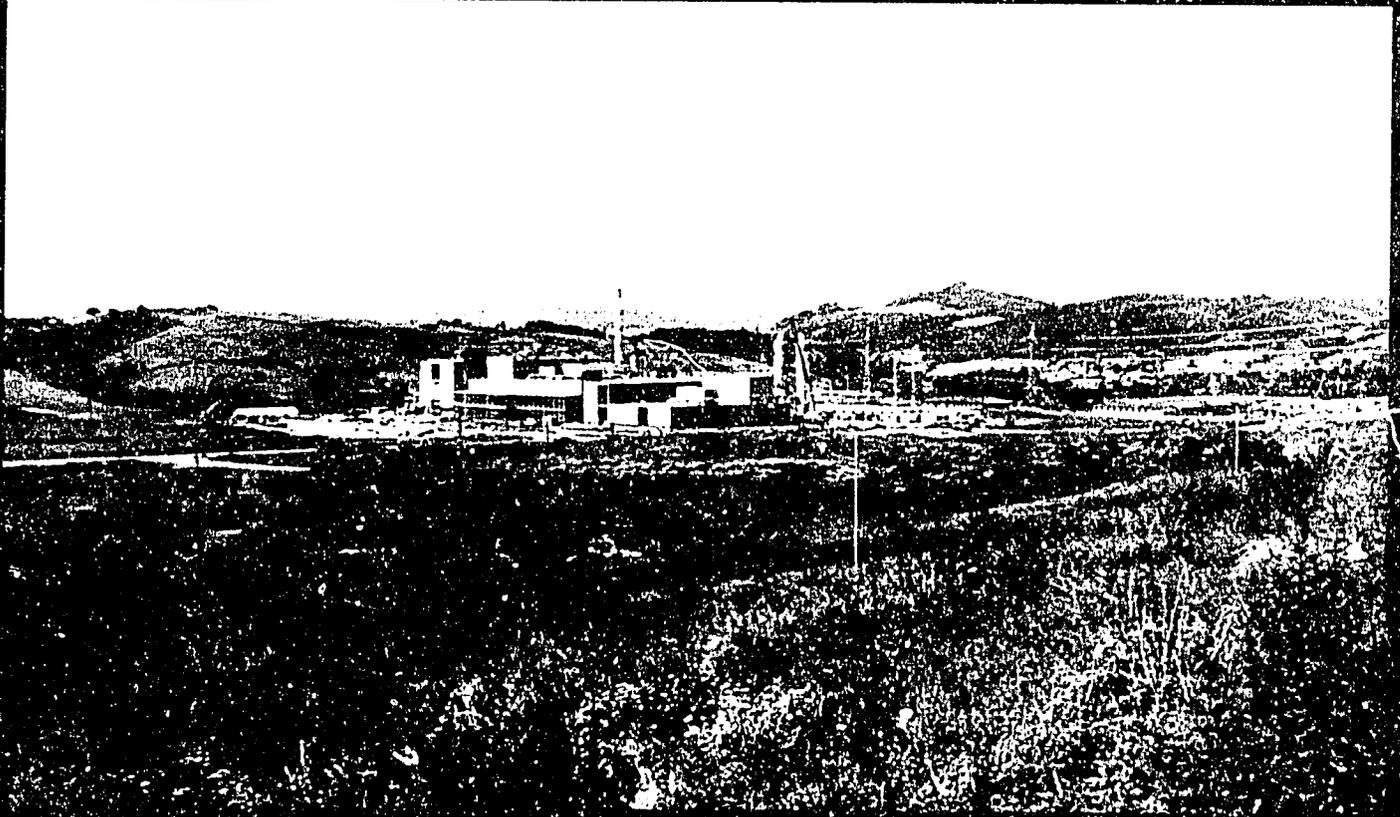


G O A L : To eliminate all toxic discharges to the ground by 2000, or verify that they have become non-hazardous.



LAND TOXICS (billions of pounds)

This goal is based on hazardous waste as defined by the U.S. Resource Conservation and Recovery Act, a much broader definition than the Toxic Release Inventory. The chart above is on a dry weight basis. Most material is injected with water into EPA-permitted deepwells. Major progress toward this goal is expected to begin by the middle of the decade.



RESPONSIBLE CARE is a mandatory initiative of the U.S. Chemical Manufacturers Association that sets forth principles and six Codes of Management Practice to guide member company safety, health and environment programs. Du Pont participates in the U.S. Responsible Care effort — a banner emblazons the Edgemoor, Delaware, white pigments plant — and in similar industry programs around the world.



Du Pont revamped its environmental management systems in 1992, beginning with the board of directors. A board-level Environmental Policy Committee was created to monitor the company's environmental policies and support its "leadership role in corporate environmentalism." The committee comprises five outside directors, including the committee chairman, and one insider — the corporate vice chairman. (Committee members and other Du Pont environmental leaders are listed on the inside back cover.)

Beyond the board, every employee is responsible for environmental stewardship. To put teeth in this concept, the compensation of the top-level Operating Group and of other officers and managers is determined in part by their environmental performance. Other employees are recognized with awards and bonuses, including the corporate Environmental Excellence Awards.

Companywide, an Environmental Leadership Council develops environmental policy and oversees performance. Committee members are mainly senior vice presidents who lead major businesses and staff functions. To coordinate programs and link the business sectors, a Safety, Health and Environmental Excellence Center was established this year.

The center's organization parallels the Chemical Manufacturers Association's "Responsible Care" Codes of Management Practice, and includes:

- Employee health and safety
- Environmental stewardship
- Process safety management
- Product stewardship
- Community awareness and emergency response, and
- Distribution.

Responsible Care was instituted to improve the U.S. chemical industry's environmental performance and is mandatory for CMA members. Du Pont also participates in STEP, a similar program for the oil industry sponsored by the American Petroleum Institute, and in parallel programs around the world. These include Responsible Care in Canada, similar programs in Europe sponsored by the European chemical industry association (CEFIC), and activities in Asia-Pacific under the auspices of chemical industry associations there. Du Pont Latin America has introduced and promoted the Responsible Care concepts in that region.

Environmental performance is driven and monitored by other company management systems as well. The annual planning process for each of Du Pont's 34 major businesses includes a forecast of the capital and operating costs and the number of people required to carry out company environmental policies and meet the environmental goals. The environmental performance of each business is reviewed regularly by the chairman, who looks at more than a dozen measures, including compliance with corporate policies, proactive environmental programs, and environmental incidents.

Formal auditing of environmental performance began in 1985. In 1991, there were 62 audits at chemical plants and a benchmarking study of energy facilities; and 65 audits were scheduled in 1992, more than one-third outside the U.S. Each business unit audits its own plants' performance, but most of the audit teams include members of business units other than the one being audited. In a few cases, audit teams have included members of the public. As a further check on independence and objectivity, the company employs an outside environmental auditing firm, McLaren/Hart Environmental Engineering Corporation, to evaluate the program and conduct oversight audits. The Executive Summary of the 1991 evaluation is reprinted on pages 14-15, together with the company's response to the recommendations. McLaren-Hart is also providing additional training to Du Pont employees around the world in environmental auditing.

Another way of monitoring environmental performance is through incident reporting. Du Pont's longstanding system for recording employee injuries, on and off the job, is the basis for setting goals, measuring performance and insuring that the safety lessons learned at one site are communicated throughout the company. A similar system is being developed for environmental incidents, and the first attempt to construct an "incident index" is shown on page 12.

Beyond the incident system, a new program to underscore legal compliance is being introduced for employees. They are urged to report instances of "significant noncompliance" to their management and have the option of reporting noncompliance to a general auditor's "hot line" telephone number: (302) 774-1300.

IMPROVING PERFORMANCE

To improve environmental performance, several corporate committees bring together company expertise. The Corporate Environmental Technology Panel shares innovations and sponsors environmental R&D programs. The Corporate Energy Leadership Team recommends energy goals and the means to improve energy efficiency, and a Global Change Council integrates the issues of global warming and ozone depletion into the businesses. The Corporate Groundwater Steering Committee has been effective in a proactive approach to groundwater protection, and the Waste and Emission Management Committee coordinates the company's pollution prevention and waste management programs.

In addition, Du Pont participates in industry groups that address environmental issues. The company helped form the Atmospheric Research Council, which sponsors academic research to aid chemical manufacturers and policy makers in better understanding the impact of volatile emissions on the global environment. The company is actively involved in the World Environment Center, a non-advocacy organization whose mission is to contribute to sustainable development by strengthening health, safety and environmental practices worldwide. Du Pont received the WEC Gold Medal Award for International Corporate Environmental Achievement in 1987.

Du Pont and its energy subsidiary, Conoco, recently ratified "A National Water Quality Agenda for the 21st Century" — recommendations to improve water quality management made by Water Quality 2000, a coalition of industry, environmental groups, governments, universities and professional and scientific societies. Conoco is also involved in the Marine Spill Response Corporation, established by the Marine Preservation Association to manage a network of oil spill response centers.

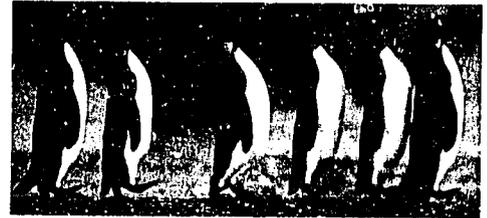
Du Pont's chairman has been one of 48 chief executive officers on the Business Council for Sustainable Development, which encourages sustainable industrial growth. The Council's report, "Changing Course: A Global Business Perspective on Development and the Environment," was prepared for the recent Earth Summit in Rio de Janeiro.

The International Chamber of Commerce drafted a Business Charter on Sustainable Development, which sets forth principles to guide companies in improving, measuring and reporting environmental performance. Du Pont co-chaired the effort that, to date, has been endorsed by more than 1000 organizations worldwide. In a related development, the Global Environmental Management Initiative has proposed a program, based on the sustainable development charter, to help companies prioritize environmental improvements.

Finally, Du Pont has made its environmental know-how available to customers through Safety and Environmental Resources, a commercial venture, and through technical and marketing programs that follow Du Pont products — and products made from them — through the distribution chain. Some of these programs are described in the next two pages.

AWARDS for environmental performance are given throughout the company, capped by the corporate Environmental Excellence Awards. Each year, a dozen top achievements are selected from more than 400 nominations, by a committee that includes representatives from environmental organizations. The winners in 1992 were: a new bioremediation technology; the replacement of an industrial cleaning solvent with water; an international, inter-industry technology exchange to reduce emissions of nitrous oxide, a global warming chemical; a new esteroid, produced from waste, that reduces ash to be landfilled; the reduction of carbonyl sulfide emissions; new environmental guidelines for chemical plant design; an electronic newsletter to exchange wastes and unused chemicals; and outside the U.S., groundwater protection in Germany, wildlife habitat enhancement in Spain, waste elimination in the Netherlands, an emergency chemical information center in Colombia, and community outreach in Taiwan (pictured). The awards include a trophy in the shape of Du Pont's environmental symbol (see page 16) and a \$5,000 grant to an external environmental organization or project chosen by the winner. The trophies are presented by Archie Dunham, chairman of the Environmental Leadership Council (left) and Edgar S. Woolard, Jr., company chairman and chief executive officer (right).





PENGUINS are used as the communication symbol for "Suva", Du Pont's family of refrigerant alternatives to CFCs.

Corporate environmentalism involves marketing as well as manufacturing. Across the spectrum of Du Pont's businesses, the company is advancing its understanding of the environmental impact and fate of products. Du Pont is developing more environmentally friendly products, modifying processes and building new plants to make them. The company is providing manufacturing and waste handling technology and services to its customers, and working with industry groups to provide societal solutions to broad environmental problems.

There are numerous examples. Agricultural Products has developed new compounds that are effective at ounces per acre rather than pounds. Imaging Environmental Services is reclaiming 100 million pounds of photographic scrap, generated by the company and its customers. The two examples below deal with timely developments of special interest to society: recycling, particularly plastics, and phasing out CFC production.

RECYCLING

As a major producer of plastic resin, Du Pont is actively involved in industry programs to recycle plastics and is committing significant technical resources to increase our knowledge of tertiary recycling. Several technical breakthroughs promise to enhance the conversion of plastic products into reusable raw material.

"Methanolysis" reverses the process used to make PET (polyethylene terephthalate) soft drink bottles and produces the chemicals, dimethyl terephthalate and ethylene glycol, to make new PET. "Depolymerization" unlinks the polymer chains and converts different kinds of plastics into their basic building blocks. "Pyrolysis" is the ultimate conversion technology, returning plastics to their original feedstocks of oil or natural gas.

Increasingly, the ability to be recycled is being built into plastic products. "Bexloy" is a recyclable engineering thermoplastic that Chrysler is using for fenders in its 1993 passenger cars. "XTC" is a new thermoplastic composite sheet for auto body panels that can be returned to its original ingredients through methanolysis. Such product developments make plastic auto parts practical, and their lighter weight contributes to greater fuel efficiency.

Another technical breakthrough is the development of polylactides, polymers made from a waste product of cheese production. The outcome of a Du Pont-ConAgra joint venture, polylactides promise to make coated paper products – such as insulated drink cups, fast food containers, frozen food packages and coated printing papers – more degradable and recyclable.

The issues of recycling go beyond technology and beyond the resources of one company or even of industry. Du Pont is among the founders of the American Plastics Council, which brings together companies in the North American plastics industry and their customers. The objective: to encourage the responsible manufacture and disposal of plastics and to communicate with the public.

Currently, recycling is restrained by a shortage of markets for recovered materials. In 1992, Du Pont and 20 other companies launched a business alliance, under the wing of the National Recycling Coalition, to recruit 5,000 small and large U.S. firms to buy recovered materials.

Needless to say, Du Pont recycles as part of its operations. Du Pont sites reported to EPA that they recycled 280 million pounds of process waste generated in 1991. In addition, the company operates 11 industrial plastics recycling plants that reprocess more than a billion pounds of materials each year. Most sites have local recycling programs for all materials, including paper and cans.

CFCs (CHLOROFLUOROCARBONS)

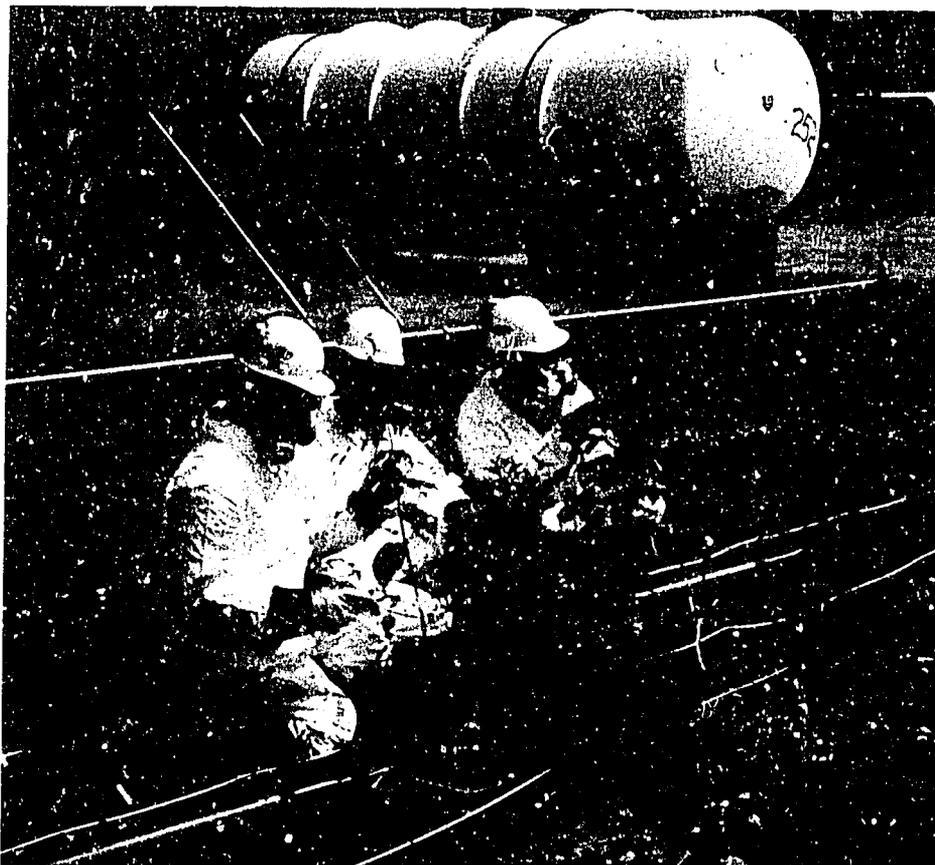
Du Pont is committed to phasing out the production of CFCs as soon as possible. The company supports the U.S. government's objectives in this regard and is further committed to phasing out CFC production in the United States and other developed countries no later than the end of 1995. Over the years, Du Pont has provided leadership in responding to the scientific and technical developments surrounding chlorofluorocarbons, and has made extraordinary efforts to hasten the worldwide elimination of CFCs and to find suitable replacements.

Progress has been impressive. Du Pont CFC production in 1992 will be less than half the level produced in 1986 and substantially below the level permitted by the Montreal Protocol and the U.S. Clean Air Act. The Worldwatch Institute reports in *Vital Signs* that industrywide production has fallen 46 percent from the peak year of 1988. The Institute counts this among the "positive trends" in 36 worldwide environmental and social indicators it monitors.

Du Pont would cease production of CFCs immediately if substitute products and equipment were broadly available. To cease manufacture of CFCs would have no meaningful impact on our financial results. But we, along with the governments of the world who could ban production of CFCs, recognize that these materials are required to meet societal needs.

These needs are vital to the health and well-being of the peoples of the world. They include refrigeration to protect the perishable food supply and the cooling systems that are a requirement, not a luxury, to operate manufacturing processes, factories, office buildings, supermarkets, hospitals and government buildings in many areas of the world. Precipitous elimination of CFCs would result in disruptions to commerce, medical care and the food supply.

Du Pont regularly assesses its phaseout program. We feel that it is the responsibility of governments and users to decide whether CFCs continue to be essential, and that it would be irresponsible to disregard the considered positions of international bodies and world governments through a unilateral decision to cease production.



RESEARCH is a thread that runs through this report and through Du Pont's environmental stewardship. In some cases, new fundamental knowledge is needed. For most progress, the nuts and bolts of technical development is required. In Europe and the U.S., for example, Du Pont changed the composition of over 400 engineering polymers - working with customers - to eliminate toxic heavy metal pigments used for coloring. At the company's plant in Victoria, Texas, scientists discovered that bacteria could be used to destroy toxic chlorinated solvents (PCE and vinyl chloride), and to clean up groundwater. At the Chambers Works in Deepwater, NJ, one of Du Pont's biggest and oldest chemical plants, scientists (pictured) are looking into another technique of "green" remediation: using plants to clean up contaminated soil, specifically ragweed to absorb lead.

ENVIRONMENTAL DATA

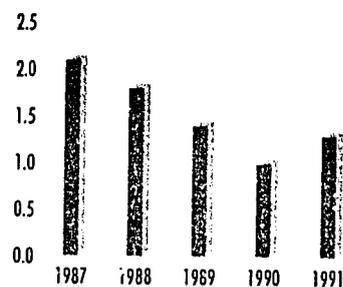
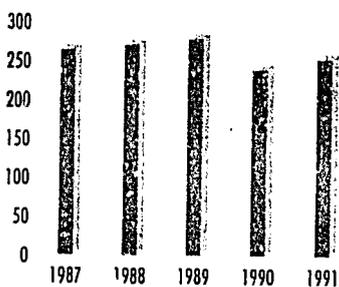
TOXIC RELEASE INVENTORY (millions of pounds)

DU PONT U.S. CHEMICALS & SPECIALTIES (C&S)

	1987	1988	1989	1990	1991
RELEASES¹					
Air ²	60.9	55.6	52.7	46.4	44.7
Water	1.7	1.5	1.9	1.4	1.4
Land	1.4	4.4	0.6	0.7	0.3
RELEASES TO ENVIRONMENT	64.0	61.5	55.2	48.5	46.4
Injection Wells ³	175.0	181.5	196.5	166.5	186.9
TOTAL RELEASES	239.0	243.0	251.7	215.0	233.3
TRANSFERS⁴					
Off Site	22.9	25.6	25.2	22.1	19.0
POTW ⁵	5.5	2.6	2.1	2.4	1.8
TOTAL TRANSFERS	28.4	28.2	27.3	24.5	20.8
TOTAL C & S	267.4	271.2	279.0	239.5	254.1

CONOCO NORTH AMERICAN REFINING

	1987	1988	1989	1990	1991
RELEASES					
Air	1.9	1.7	1.3	.9	1.1
Water	.01	.03	.03	.02	.17
Land	.15	.07	.04	.03	.05
TOTAL REFINING	2.1	1.8	1.4	1.0	1.3



¹ Data has been adjusted by removing deletions and newly-listed chemicals, to enable year-to-year comparisons

² Excluding HCl from fuel combustion and chlorofluorocarbons

³ Including only the ammonia portion of ammonium sulfate

⁴ Not including transfers for recycle and reuse, first reported in 1991

⁵ Publicly Owned Treatment Works

AIRBORNE CARCINOGENS

CHEMICAL	1987	1988	1989	1990	1991
1, 2-Dibromoethane	6,460	8,600	24,272	20,313	17,544
1, 3-Butadiene	279,636	177,223	180,764	153,349	129,184
1, 4-Dioxane	43,268	44,337	65,202	94,721	104,625
4, 4-Methylenedianiline	107	761	112	0	0
4-Aminobiphenyl	10	10	1	0	0
Acetaldehyde	1,299,463	1,464,893	1,506,080	1,250,730	1,252,237
Acrylonitrile	492,898	413,407	410,398	343,034	332,996
Aniline	18,971	22,364	19,422	20,204	27,271
Arsenic	5	6	6	8	18
Benzene	638,030	502,374	455,414	333,089	221,982
Carbon Tetrachloride	121,926	132,514	161,714	181,208	172,020
Chloroform	377,250	257,126	223,997	164,115	180,339
Chromium Compounds	7,603	7,429	5,215	2,823	4,715
Dichloromethane	4,714,573	3,532,328	3,837,729	1,827,373	1,827,912
Dimethyl Sulfate	4,009	0	2,220	1,286	1,481
Epichlorohydrin	530	780	872	0	0
Ethylene Oxide	12,718	6,212	5,615	5,996	9,666
Formaldehyde	303,244	316,876	109,027	152,998	157,802
Lead	500	865	0	0	0
Nickel	74	74	74	74	17
Nickel Compounds	202	4	2	32	15,231
Tetrachloroethylene	66,963	76,709	52,836	47,134	38,418
Totals	8,388,440	6,964,892	7,060,972	4,597,987	4,493,508

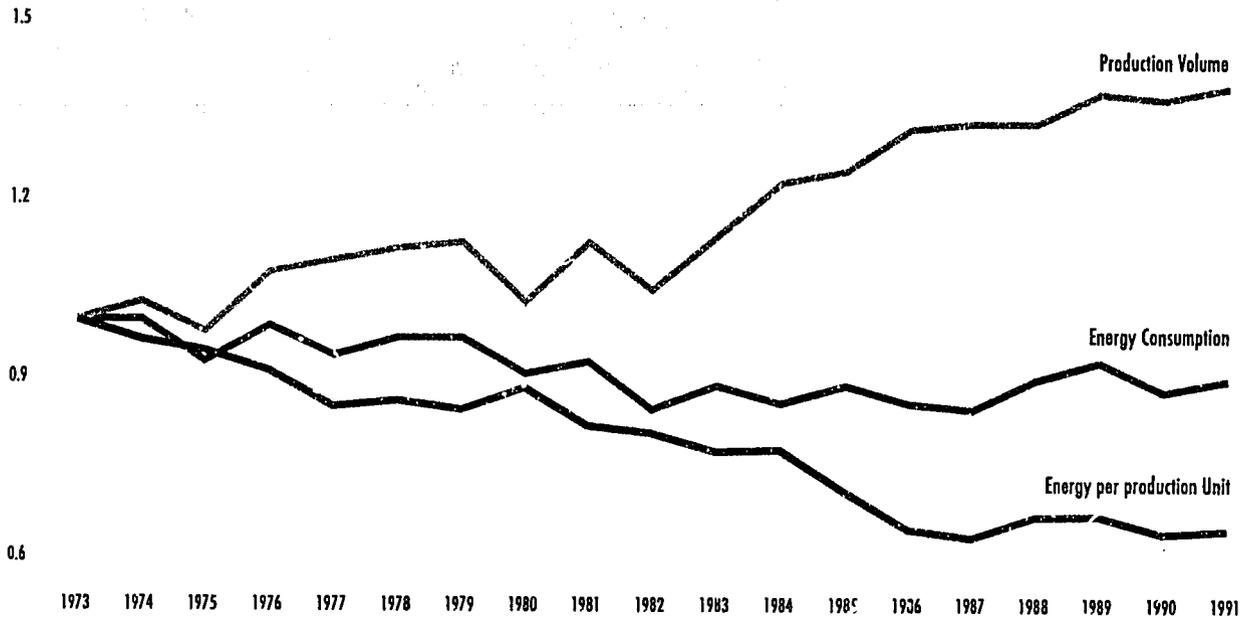
Source: Toxic Release Inventory.

33/50 CHEMICALS

CHEMICAL	1988	1989	1990	1991
1, 1, 1-Trichloroethane	543,042	347,491	334,352	200,318
Benzene	827,772	777,194	672,820	899,973
Carbon Tetrachloride	322,425	444,329	430,910	480,399
Chloroform	441,076	288,845	215,345	215,852
Chromium Compounds	140,654	131,820	144,040	118,920
Cyanide Compounds	2,311,724	2,833,650	2,113,804	1,541,168
Dichloromethane	5,002,303	4,655,097	2,444,949	2,025,346
Hydrogen Cyanide	663,460	862,356	764,593	676,539
Lead	27,910	17,200	1,185	46
Lead Compounds	323,936	257,957	983,314	278,271
Methyl Ethyl Ketone	361,681	319,972	242,657	411,078
Methyl Isobutyl Ketone	46,982	23,177	97,230	29,346
Nickle	355	281	437	17
Nickle Compounds	1,267,431	1,496,514	1,110,673	1,002,335
O-Xylene	963,549	916,260	975,449	554,000
P-Xylene	1,110,100	969,960	822,630	681,600
Tetrachloroethylene	79,817	54,474	74,428	43,040
Toluene	2,872,373	4,915,268	3,457,450	2,299,598
Trichloroethylene	1,430	13,126	12,508	13,080
Xylene (Mixed Isomers)	1,646,813	2,182,809	2,154,945	3,508,794
Totals	18,646,813	21,507,780	17,053,719	14,979,720

Source: Toxic Release Inventory. Includes air, water and land discharges. Not including transfers for recycle and reuse in 1991.

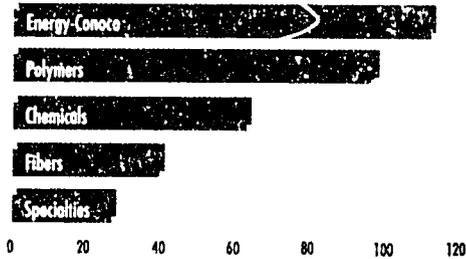
DU PONT ENERGY UTILIZATION



1973=100%

The energy index includes all purchased fuels, electricity and steam. Feedstock uses are excluded
The production index excludes small volume products that are not conveniently measured by weight.

1991 ENVIRONMENTAL INCIDENT INDEX

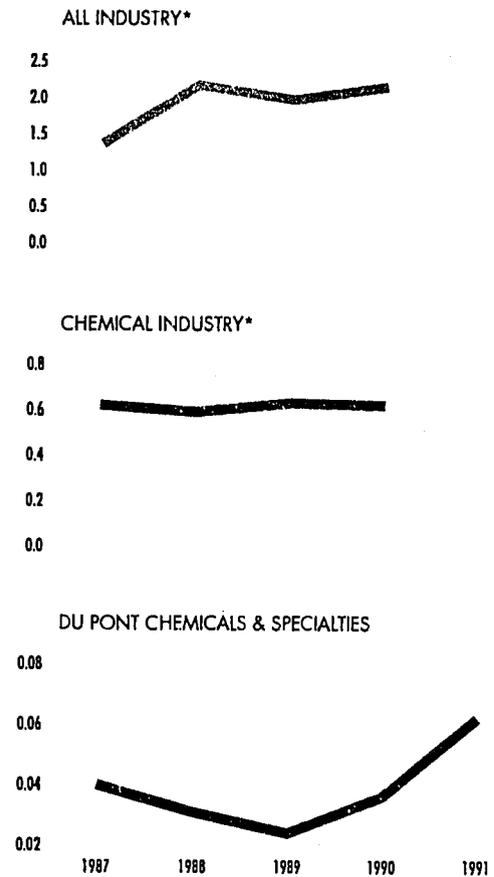


1990=100%

Du Pont's first Incident Index shows serious environmental incidents - inadvertent spills, leaks and releases - for each business segment as a percentage of the base year 1990. Serious incidents are reported to the Environmental Leadership Council and the CEO.

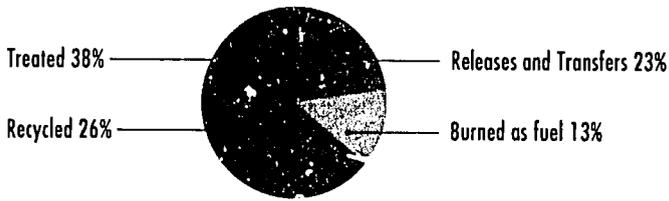
SAFETY

(injuries per 200,000 hours worked)



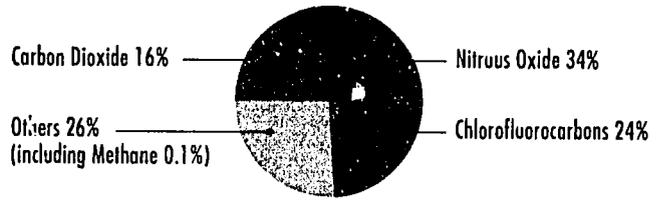
*1991 data not available for chemical industry and all industry.

WASTE AS GENERATED
(% OF TOTAL, 1991)



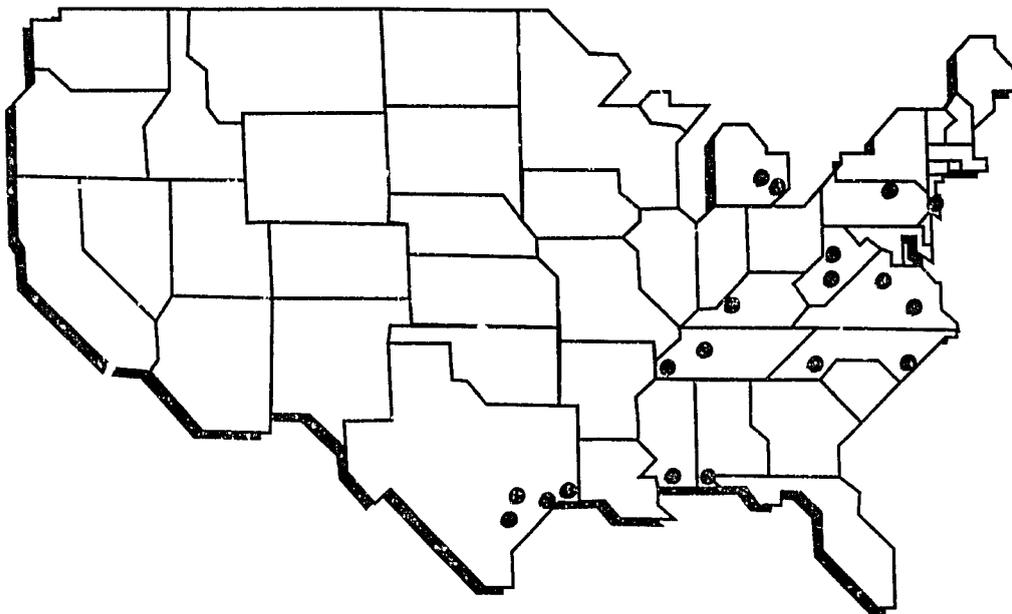
Source: 1991 Toxic Release Inventory. Du Pont reported to the EPA that it generated nearly 1 billion pounds of waste in 1991, the first year this accounting was required.

GREENHOUSE GASES
(CO₂ EQUIVALENT, % OF TOTAL, 1991)



Based on comparisons of greenhouse gases developed by the U.N. Intergovernmental Panel on Climate Change. The comparisons do not consider the indirect effects of CFCs, methane or other greenhouse gases. Indirect effects might reduce or eliminate the direct contribution of CFCs.

TOXIC RELEASE INVENTORY BY MAJOR PLANT SITES



1991 RELEASES AND TRANSFERS¹ (MILLION LBS)

New Johnsonville, TN	59.2
DeLisle, MS	47.1
Beaumont, TX	35.4
Victoria, TX	27.2
Louisville, KY	23.6
LaPorte, TX	12.7
Brevard, NC	12.0
Manati, Puerto Rico	10.9
Sabine, TX	8.5
Deepwater, NJ	8.1
Towanda, PA	7.8
Memphis, TN	7.7
Cape Fear, NC	6.9
Flint, MI	4.8
Mt. Clemens, MI	4.5
Mobile, AL	4.4
Ft. Royal, VA	3.7
Belle, WV	3.5
Richmond, VA	2.5
Parkersburg, WV	2.3

¹ Includes transfers for recycle and reuse, reported for the first time in 1991.

EDITOR'S NOTE: Following is the actual Executive Summary of Du Pont's first environmental audit by an outside environmental engineering firm. McClaren/Hart Environmental Engineering was retained by the company to evaluate the environmental audit process and to conduct oversight audits. The outside review found that our formal environmental audit program was young, that it had many strengths but that it would benefit from "fine tuning." The auditors made three key recommendations, which the company is implementing -- to develop consistent classification of findings, to reduce the time for corrective action and to improve the audit follow-up. A new classification scheme was put in place this year that identifies incidents as requiring immediate action ("substantial risk to the environment"), priority action ("should not continue beyond the short term") and action (isolated, occasional or administrative). The time for sites to submit corrective action plans has been cut from 90 to 45 days following the audit report, and the follow-up has been strengthened by tracking intermediate steps and the completion of corrective action. A quarterly status report will be required on open items.



In summary, the Du Pont Audit Program is an excellent one. Its structure, content and procedures generally meet or exceed those of programs generally found in Fortune 200 companies. However, in some ways, Du Pont is not as far along as comparable companies with longstanding audit programs. The Du Pont program, as currently structured, is less than three years old and, as a consequence, some fine tuning is required. The major challenge for Du Pont is to assure that sufficient management resources are committed to the program over the next few years in order to meet stated objectives.

A summary of the program's major strengths and development needs is provided below. Comments related to individual business sector programs are provided in the individual reports for those programs. In general, only findings that are applicable companywide are presented in this report. However, this could include unique aspects of a business sector program, which could have general applicability.

SUMMARY OF PROGRAM STRENGTHS

The program review and observation of the individual audits indicated that the Du Pont program has many strengths. This section summarizes those strengths.

THE REVIEW PROGRAM

Although less than three years old, the current program is well-developed and contains the principal elements typically found in good environmental audit programs. The key program strengths include:

- A. Corporate Environmental Affairs reports annually to the Environmental Leadership Council, the Environmental Resources Committee and the Audit Committee on the activities of the Environmental Review Program. Notwithstanding this comment, the annual reports could provide more details on the status of the site deficiencies identified by the audits. That is, are site managers responding quickly and appropriately to identified problems?
- B. The company has developed an environmental review manual that is comprehensive and helps to maintain a consistency throughout the organization.
- C. The program's pre-review questionnaire and review guides are quite comprehensive and have been automated so that they are accessible on-line throughout the organization. The review guides provide for adequate federal regulatory coverage in the areas being audited.
- D. In conducting regular oversight audits, using staff from other businesses on audit teams, and in having a third-party review of the program after three years of operation, adequate quality assurance measures have been implemented.
- E. The company has shown state-of-the-art leadership and creative adoption of CMA's Responsible Care initiatives in having the public participate on several 1991 audits. This demonstration program will continue in 1992.
- F. Procedures are sufficient to control audit records (e.g., working papers, draft findings, audit reports). Records retention and destruction procedures are appropriate.
- G. Facilities are generally being audited consistent with corporate guidelines. These guidelines are, in turn, consistent with currently accepted practices.

THE AUDITS

The individual audits generally meet the objectives of a sound audit; preparation is adequate, on-site evaluations are thorough and reporting is precise and accurate. Highlights include:

- A. The coverage of the audits is comprehensive, incorporating relevant environmental requirements.
- B. The resources committed to individual audits are more than sufficient to meet the objectives of the program. The auditor pool in Europe is small and should be expanded.
- C. The auditors are competent interviewers, technically capable, and well-versed in environmental compliance. Data gathering and verification techniques were, for the most part, sound.
- D. In one business sector, the environmental coordinator from the next site to be audited participates on the audit team. This helps to prepare that individual for the visit to his/her site.
- E. On some audits, one or more audit team members are from Du Pont sites located in the same state. When utilized, this practice aids considerably in attaining an understanding of applicable state regulations.
- F. Daily audit debriefings to site management provide open communications and minimize the risk of misunderstandings.

SUMMARY OF PROGRAM DEVELOPMENT NEEDS

Like any program, Du Pont's Environmental Review Program could be improved. Highlights of only the more significant development needs, discussed later in this report, are presented below. Development needs are given either a high or medium priority status to assist Du Pont in developing a "priority-based" action plan. More detailed discussion of the identified needs are presented in Section 5.

THE REVIEW PROGRAM

High Priority Items:

- A. The corrective-action follow-up policy (i.e., quarterly reporting by the plants/operations) is not being adhered to by most of the business sector programs. Follow-up is typically accomplished on an ad hoc basis.
- B. Allowing 90 days for completion of the audit report and corrective action plan compromises the momentum gained by the audit and is a more relaxed schedule than is found in typical competitors' programs. In many cases even this 90-day period is being exceeded substantially.
- C. Generally, the program and the audits meet a "reasonable" independence test. However, with the business sector review programs placed within the manufacturing organization, the independence of the program is not fully achieved. Further, the business sector SHEA staff often provide compliance assistance to the sites as well as lead audit teams of those same sites. This presents some potential conflicts. (Note: other techniques, e.g., oversight audits, cross-business participation, have been adopted to mitigate this issue.)
- D. There is no clear guidance on how audit teams are to assess facility compliance with state regulations. In most cases, auditors rely on site staff for determining state regulatory applicability. This compromises the independence of the audit.
- E. The audit protocols are not updated annually, as required by the program's guidelines. Further, the protocols are redundant in some ways and could be re-designed to be made more efficient. The International Protocols still require some "de-Americanization."

Medium Priority Items:

- F. Most business sectors have not developed a formal program plan, which would guide the operation of the program and allow for a smooth transition if there were management changes.
- G. The purpose of the corporate oversight audits is not clearly articulated nor understood. CEA has not followed up consistently on oversight audit recommendations.
- H. Although it is only "recommended" that audit reports receive legal review, this practice is not uniformly conducted among the business sectors.
- I. Only one business sector (Imaging Systems) has adopted the practice of follow-up evaluations of the audit team by the site environmental management. This practice should be considered universally.

THE AUDITS

High Priority Items:

- A. Audit teams frequently struggle with whether the objective of the reviews is to identify management system findings or detailed compliance findings.
- B. Site closing conferences typically are not crisp, succinct reviews for management. They often ramble and can be misleading about the status of compliance at the site. Leaving draft findings at the site or submitting a draft report within one week would help to maintain the momentum of the audit. Presently, nothing written is left with site management and draft reports are sometimes submitted months later.
- C. Audit report styles are varied and the content can ramble. Findings are not always easily identified by the reader and, until the practice was recently instituted in some business sectors, no findings priorities are established. Citations for compliance findings are not provided in the reports.

Medium Priority Items:

- D. Proper verification techniques are not always adopted. Reliance on the results of interviews without follow-up verification occurs frequently.
- E. Ancillary site activities (e.g., maintenance, contractors, purchasing) are not audited with the same rigor as line operations and regulated units (e.g., waste storage pads).
- F. Audits of sites with a host and one or more tenants do not always get the full cooperation of the tenants.
- G. The finding of requiring the sites to conduct self-audits in between business sector, third-part audits is not uniformly incorporated into all audit reports.

SAFETY, HEALTH AND ENVIRONMENTAL POLICY

WHEREAS SAFETY, HEALTH, AND ENVIRONMENTAL QUALITY HAVE LONG BEEN OF PRIMARY IMPORTANCE TO DU PONT,

RESOLVED THAT THIS COMPANY AS A MATTER OF POLICY:

1. WILL COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS RELATED TO SAFETY, HEALTH AND ENVIRONMENTAL QUALITY IN ITS MANUFACTURING, PRODUCT DEVELOPMENT, MARKETING AND DISTRIBUTION ACTIVITIES;
2. WILL ROUTINELY REVIEW ITS OPERATIONS FOR THE PURPOSE OF MAKING SAFETY, HEALTH AND ENVIRONMENTAL QUALITY IMPROVEMENTS BEYOND THOSE LEGALLY REQUIRED, WHERE SUCH IMPROVEMENTS PROVIDE SIGNIFICANT BENEFITS AT REASONABLE COST;
3. WILL DETERMINE THAT EACH PRODUCT CAN BE MADE, USED, HANDLED AND DISPOSED OF SAFELY AND CONSISTENT WITH APPROPRIATE SAFETY, HEALTH AND ENVIRONMENTAL QUALITY CRITERIA; AND
4. WILL INFORM EMPLOYEES AND THE PUBLIC ABOUT THE SAFETY AND HEALTH EFFECTS OF ITS PRODUCTS AND WORKPLACE CHEMICALS; AND WILL PROVIDE LEADERSHIP IN ESTABLISHING PROGRAMS TO RESPOND TO EMERGENCIES INVOLVING HAZARDOUS MATERIALS IN COMMUNITIES WHERE THE COMPANY HAS A SIGNIFICANT PRESENCE.



Du Pont
Environmental
Excellence



Responsible Care®

ENVIRONMENTAL programs are symbolized by Du Pont's internal environment logo, top - showing the air, land and water the programs protect - and the "Responsible Care" logo of the U.S. Chemical Manufacturer's Association.

RESOLVED FURTHER THAT THIS POLICY SHALL APPLY TO DOMESTIC AND FOREIGN CONSOLIDATED SUBSIDIARIES AND TO AFFILIATES FOR WHICH THIS COMPANY OR A CONSOLIDATED SUBSIDIARY HAS OPERATING RESPONSIBILITY.

THIS POLICY WILL BE ADMINISTERED THROUGH LINE MANAGEMENT OF SUCH SUBSIDIARIES OR AFFILIATES;

RESOLVED FURTHER THAT THIS COMPANY WILL ENDEAVOR TO HAVE DOMESTIC AND FOREIGN AFFILIATES, WHERE IT DOES NOT HAVE OPERATING RESPONSIBILITY, ADOPT COMPARABLE SAFETY, HEALTH AND ENVIRONMENTAL QUALITY POLICIES;

RESOLVED FURTHER THAT EACH DEPARTMENT IS RESPONSIBLE FOR THE DEVELOPMENT AND IMPLEMENTATION OF PLANS AND PROGRAMS TO ENSURE THAT ITS OPERATIONS COMPLY WITH THE SAFETY, HEALTH AND ENVIRONMENTAL QUALITY POLICY AND TO ASSIST IN PROMOTION OF PUBLIC ACCEPTANCE OF CORPORATE EFFORTS TO PROTECT THE SAFETY AND HEALTH OF EMPLOYEES, CUSTOMERS AND THE PUBLIC AND TO PROTECT THE ENVIRONMENT.

RESOLVED FURTHER THAT ALL PREVIOUS STATEMENTS RELATING TO THE FOREGOING HEREBY ARE RESCINDED.

Adopted November 24, 1971

Revised August 9, 1985

DU PONT ENVIRONMENTAL REPORT

CHIEF ENVIRONMENTAL OFFICER

Edgar S. Woolard, Jr.
Chairman of the Board and Chief Executive Officer

ENVIRONMENTAL POLICY COMMITTEE

Howard W. Johnson, Chairman
*President Emeritus and Former Chairman
Corporation of the Massachusetts Institute of Technology*

Elwood P. Blanchard, Jr.
Former Vice Chairman, Du Pont

Charles R. Bronfman, O.C.
*Co-Chairman of the Board
The Seagram Company Ltd.*

Edgar Bronfman, Jr.
*President and Chief Operating Officer
The Seagram Company Ltd.*

Louisa C. Duemling

John A. Krol
Vice Chairman, Du Pont

ENVIRONMENTAL LEADERSHIP COUNCIL

Archie W. Dunham
*Chairman
Executive Vice President, Exploration Production, Conoco*

Bruce W. Karrh
*Vice Chairman
Vice President, Integrated Health Care*

Michael B. Emery
*Senior Vice President, Engineering, Information Systems, and
Materials and Logistics*

Ross W. Fasick
Senior Vice President, Polymers and Automotive Products

William F. Kirk
Vice President and General Manager, Agricultural Products

Paul Z. Larson
Vice President, Chemicals

Robert v.d. Luft
Senior Vice President, Chemicals

John R. Malloy
Senior Vice President

Robert E. McKee
Executive Vice President, Exploration Production, Conoco

John F. Schmutz
Senior Vice President, Legal

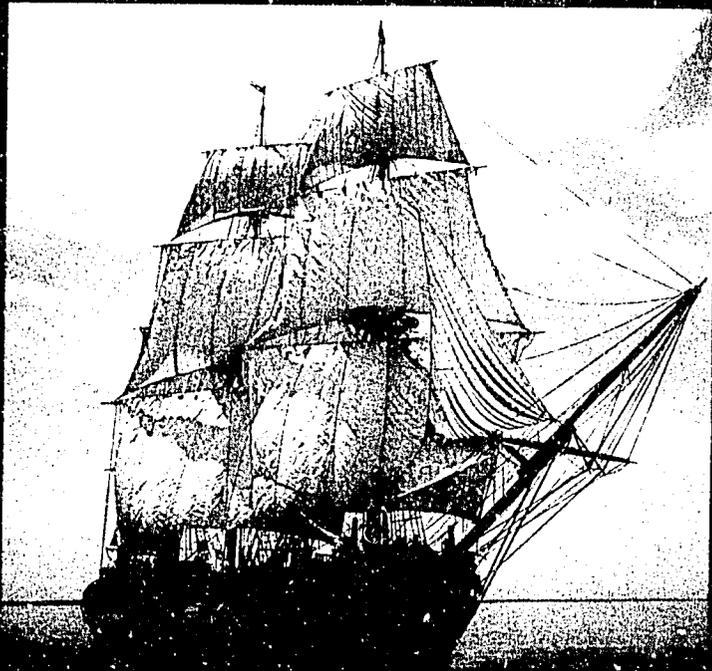
BACK COVER: THE HMS ROSE, a replica of an 18th century frigate, has 13,000 square feet of sail made from recycled plastics. Du Pont undertook the sail-making project to demonstrate that recycling can produce high-performance materials. The sails, made from 126,000 plastic soda bottles and fenders of "Dexloy" composite, must withstand storm force winds and respond to the gentlest breezes.



This report was printed by Du Pont Printing and Publishing on recycled paper (10% post consumer waste), using "Taya" soy-based inks. Pre-print production used the DuPont "Waterproof" proofing system, which eliminates solvent emissions.

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APPENDIX A, #3 - EXAMPLES OF AUDIT PROTOCOLS

2. How are facility and company management made aware of environmental problems or incidents (e.g., reportable releases, etc.)?

a. What mechanisms are used?

b. Who is notified?

3. Did the facility pay any penalties or get notified for either an investigation deficiency or as a result of an incident since the last environmental review?

4. Area/Site/Community Classifications:

Describe surrounding area in terms of land use:

Land Use	Percent (%)
a. Commercial	
b. Industrial Park	
c. Residential	
d. Agricultural	

Auditor Notes

A. INTRODUCTION

BACKGROUND INFORMATION

1. Most recent emission inventory report
2. Facility diagrams including stationary air emissions sources.
3. Reports to agencies regarding air quality management.
4. Plans for achieving/maintaining compliance and/or enhancing performance.
5. General public complaints or incidents due to odor, smoke, or other discharge.
6. Other plans for achieving reduction of emissions.
7. Air pollution alert and emergency plans.

B. UNDERSTAND MANAGEMENT SYSTEMS

Obtain and document your understanding as to how the facility manages its air quality programs. Review the following:

EMISSION SOURCE IDENTIFICATION

8. Facility procedures to identify all air emission sources such as existing and new process emission points, laboratory hoods, etc. (e.g., periodic tours of facility, review of process flow diagrams, information obtained from facility personnel).
9. Facility methods to characterize the nature and volume of pollutants emitted through each air source (e.g., emission monitoring and analysis, knowledge of process and resulting emissions, mass balance calculations).

AIR QUALITY

REGISTRATION AND PERMITS

- 10. Activities undertaken by the facility to ensure that all air sources (e.g., new sources, modified sources, etc.) are registered and/or permitted in accordance with regulatory requirements (e.g., review of regulations, determinations of registration or permitting needs obtained from regulatory officials, etc.).

- 11. Activities undertaken by the facility to ensure that new or modified air emissions sources and control equipment are properly registered or permitted (e.g., review of registration, meetings with regulatory officials, implementation of installation or permitting compliance plan, etc.).

CONFORMANCE WITH AIR EMISSION STANDARDS

- 12. Facility programs to ensure the operability of air emissions control equipment (e.g., inspection and maintenance activities, periodic performance testing, combination of these activities, etc.).

- 13. Facility programs to ensure compliance with permit and regulatory emission limitations (e.g., periodic monitoring and analysis of emissions, periodic review of material uses and process equipment efficiencies, implementation of "agreements" with local regulatory agencies which prescribe activities to be undertaken to achieve compliance, combination of these activities, etc.).

MOTOR FUEL DISPENSING OPERATIONS

- 14. Facility programs and permits related to the purchasing and distribution of diesel fuel, LPG, leaded and unleaded gasoline (e.g., type of gasoline, type of vehicles receiving gasoline, type of gasoline dispensing nozzle, labeling).

AIR QUALITY

Auditor Notes

A. INTRODUCTION

BACKGROUND INFORMATION

1. Description of known points of solid and hazardous waste generation (including air and water pollution control equipment and wastewater treatment facilities).
2. Descriptions of wastes generated at the facility.
3. Description of waste treatment, storage, and/or disposal methods used.
4. On-site and off-site systems for solid and hazardous waste management.
5. Reports to authorities regarding solid waste management.
6. Annual authorization records for the disposal of hazardous waste.
7. Permit applications and permits regarding solid and hazardous waste operations.

B. UNDERSTAND MANAGEMENT SYSTEMS

Obtain and document your understanding as to how the facility manages its solid and hazardous wastes. Review the following:

WASTE GENERATOR ACTIVITIES

8. Procedures to identify waste sources such as production wastes, construction and demolition wastes, laboratory wastes, sewage sludge, asbestos wastes (e.g., tours of facility, information obtained from site personnel, knowledge of operations, etc.).

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Auditor Notes

ON-SITE TREATMENT, STORAGE AND DISPOSAL PRACTICES

- 17. Permit or registration requirements for on-site treatment, storage or disposal facilities (e.g., landfill, incinerator, drum warehouse).
- 18. Facility procedures to update information relating to existing permitted treatment, storage, or disposal facility (e.g., backup documentation for calculated values, methods to incorporate process changes, management's review of completed permit applications, etc.)
- 19. Programs to manage waste disposal/storage activities (e.g., waste analysis activities, preparation and maintenance of operating record, inspection program, annual report, etc.).

C. EVALUATE FACILITY PROGRAMS

GENERAL APPROACH

- 20. Conclude as to the overall adequacy of the facility's procedures to ensure compliance with solid and hazardous waste management requirements.
- 21. Review the review guide steps in Section D (below) and develop and document your overall verification strategy.
- 22. Review your verification strategy with the team leader and with other team members as appropriate.

D. TEST AND VERIFY

WASTE GENERATOR ACTIVITIES

Non-Hazardous Solid Waste Management

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Auditor Notes

A. INTRODUCTION

BACKGROUND INFORMATION

1. Facility diagrams including process sewers, sanitary sewers, storm sewers, and ditches; wastewater treatment flow diagrams; stormwater management plans, etc.
2. Reports to agencies regarding water quality.
3. Descriptions of wastewater generated at the facility.
4. Descriptions of wastewater treatment methods used.

B. UNDERSTAND MANAGEMENT SYSTEMS

Obtain and document your understanding as to how the facility manages its water quality issues. Review the following:

DISCHARGE IDENTIFICATION

5. Facility procedures to identify all wastewater discharges such as process discharge points, drains, runoff, etc.
6. Facility methods to characterize the nature and flow rate of discharges (e.g., discharge monitoring and analysis, knowledge of process and resulting discharges, mass balance calculations, etc.).

REGISTRATION AND PERMITS

7. Activities undertaken by the facility to ensure that all discharges are registered and/or permitted in accordance with regulatory requirements.

WATER QUALITY

Auditor Notes

- 8. Activities undertaken by the facility to ensure that new discharges and control equipment are properly registered or permitted.
- 9. Facility procedures to repermit existing permitted discharges and control equipment to ensure outdated data is revised (e.g., review of old control equipment changes, etc.).

CONFORMANCE WITH WASTEWATER STANDARDS

- 10. Facility programs to ensure the operability of water pollution control equipment (e.g., documentation of inspection and maintenance activities, periodic performance testing, etc.).
- 11. Facility programs to ensure compliance with permit and regulatory discharge limitations (e.g., periodic monitoring and analysis of discharges, periodic review of material uses and process equipment efficiencies, implementation of "agreements" with regulatory agencies which prescribe activities to be undertaken to achieve compliance, etc.).

STORM/RAIN DISCHARGE QUALITY

- 12. Review site topographical map and drainage areas. Are stormwater sewers, gullies, and ditches identified? On your tour determine if these are in agreement with their stated locations on the map.
 - a. Are storm water outfalls subject to permit, if so, are separate stormwater outfalls included in the permit? Have applications been requested/submitted to permitting authority?
 - b. Is there a sampling plan? Does this track regulations (e.g., quantitative analysis for various pollutant types)?

WATER QUALITY

Auditor Notes

A. INTRODUCTION

BACKGROUND INFORMATION

1. Using data supplied by the facility or provided by the review team leader, review the following:
2. Facility layout map including sewer diagrams and spill flow paths.
3. Topographic map showing run-off pathways.
4. Engineering specifications for oil and chemical storage tank and secondary containment capacities.
5. Spill Prevention Control Plan or equivalent.
6. Off-site facilities that are supervised or controlled by the facility management.
7. Chemical prevention spill plan (i.e., materials containment or best management plan).

B. UNDERSTAND MANAGEMENT SYSTEMS

Obtain and document your understanding as to how the facility manages spill emergency planning and spill control. Considerations may include:

OIL AND CHEMICAL SPILL PREVENTION PLAN

8. Activities undertaken by the facility to determine the applicability of spill prevention requirements (e.g., review of regulations, information obtained from regulatory officials or others, DuPont requirements, etc.).

SPILL PREVENTION AND CONTROL

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Auditor Notes

9. Facility activities relating to the development of an oil and chemical spill prevention plan (e.g., inventory of the location and volume of bulk and drum oil and chemical storage areas, tours to identify areas of potential spill concern and secondary containment practices, identification of appropriate spill response measures, etc.).
10. Facility procedures undertaken to ensure the plan is kept up to date (e.g., periodic review of plan, review of plan upon process changes or other facility modifications, etc.).

SPILL PREVENTION PLAN IMPLEMENTATION OR SPILL PREVENTION PRACTICES

11. Facility spill control and prevention practices (e.g., periodic tours of facility to examine practices in relation to the provisions contained in the spill plan, location of spill equipment).
12. Facility use of spill cleanup contractors and the range of services rendered by the contractor(s).
13. Facility tank, piping, and storage area inspection programs to detect leaks or cracks in the materials of construction or secondary containment systems.

OIL AND HAZARDOUS SUBSTANCE LOADING AND UNLOADING PRACTICES

14. Facility procedures to control spills during loading and unloading operations (e.g., permanent containment structures, enhanced operating procedures, etc.).

SPILL/RELEASE REPORTING PROGRAMS

15. Facility procedures to report spills to appropriate regulatory or internal groups (e.g., quantification of spilled or released

SPILL PREVENTION AND CONTROL

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APPENDIX A, #4 - PHOTOGRAPHS OF PLANT AND WORKSHOP GROUPS





VCHZ Synthesia plant environmental personnel with WEC Volunteer Specialist John Coleman (center) at the Environmental Auditing Workshop in Pardubiche-Semtin, Czech Republic during week of June 21-25, 1993

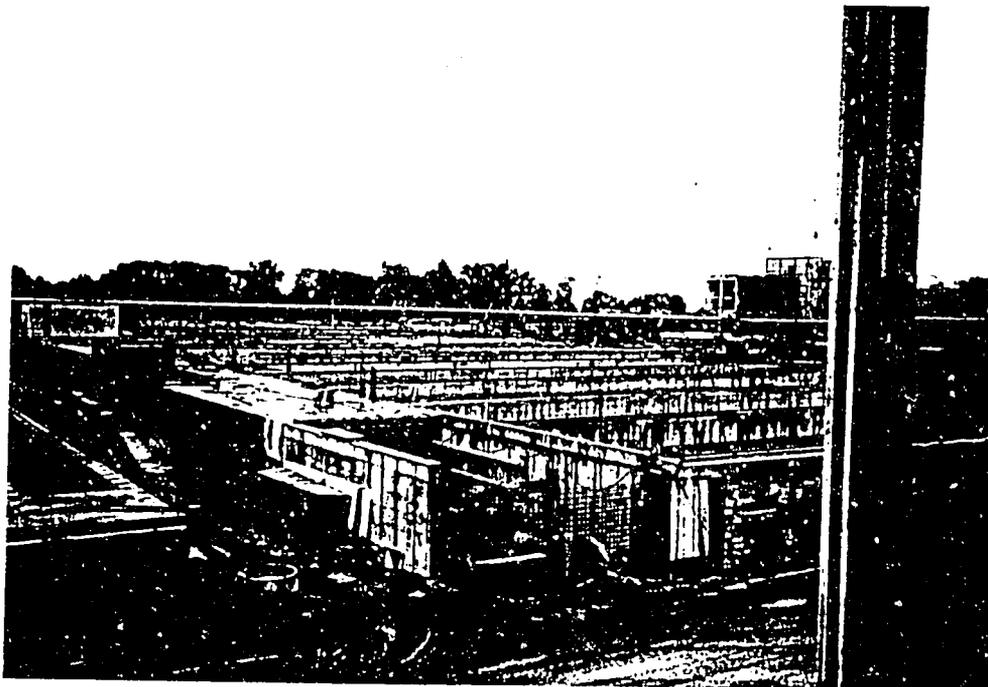


WEC Volunteer Specialist John Coleman (right) with participants in the Czech Environmental Management Center sponsored workshop on environmental auditing. The meeting was held in Pardubiche on June 28-29, 1993.

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Synthesia Ecological Scientist Jiri Klicpera and WEC Volunteer Specialist John Coleman discuss the new biotreatment facility under construction in the Czech Republic.



New under-construction biotreatment plant for industrial wastes at VCHZ Synthesia Plant in Pardubice - Semtin, Czech Republic

APPENDIX B - ITINERARY

ITINERARY

For Mr. Coleman in Czech Republic
20.6. - 29.7.1993

<u>DATE</u>	<u>TIME</u>	
20.6	9:45	Arrival in Prague
21.6	8:30 9:07 14:00-17:00	Departure from hotel in Prague Departure of the train for Pardubice Meeting with representatives of Synthesia
22.6 - 24.6		Program in Synthesia
26.6 - 27.6		Individual Program
28.6 - 29.6		Meeting with representatives of CEMC and representatives from other factories
29.6	Afternoon	Departure for Prague
30.6	11:55	Departure of the airplane for USA

APPENDIX C - PERSONS AND ORGANIZATIONS VISITED

APPENDIX C

PERSONS AND ORGANIZATIONS VISITED

1. World Environment Center—Prague:
Ludmila Hofmanova
Coordinator Czech Technical Program

2. VCHZ Synthesia:
Jan Martynek
Environmental Manager

Jaroslav Beran
Dept. Head—Water Protection and Wastes

Ivan Majer
Marketing—Interpreter

Miroslav Janecek
Director—Strategic Planning

Jiri Klicpera
Environmental Scientist

3. CEMC:
Bohuslav Moucha
Project Manager, Prague

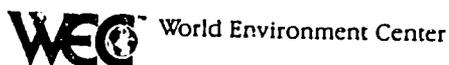
Radomir Matyas
President, Prague

Zdenek Obrsal
Chemical Ecology, Pordubiche

APPENDIX D - BUSINESS CARDS OF PERSONS CONTACTED

VCHZ SYNTHESIA TRIP

BUSINESS CARDS OF PERSONS CONTACTED



LUDMILA HOFMANOVA
COORDINATOR FOR CZECH REPUBLIC
TECHNICAL PROGRAMS

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FAX (212) 683-5053

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OLDRACHTOVA 1044
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TEL. 09-28-513

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Ing. Jan Martynek

VEDOUcí ODBORU
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fax 040 46465

E.I.A.

Dipl. Ing. Jirí KLICPERA, CSc.

ekologický audit
znalecké posudky

Privat:
Za školkou 847
533 41 Lázně Bohdaneč

hl. technolog E-001/
VCHZ Synthesia Semtin
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tel. 040 / 492 5903



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Jaroslav Beran

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Bohuslav MOUCHA

PROJECT MANAGER
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CZECHOSLOVAKIA

ČESKÉ EKOLOGICKÉ
MANAŽERSKÉ CENTRUM
CZECH ENVIRONMENT
MANAGEMENT CENTER

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FAX: (422) 226 021



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fax 040 46956



Ing. Zdeněk OBRŠÁL

Tuněchody 114
538 32 Úhřetice

telefon
0455 - 8058



VÝCHODOČESKÉ CHEMICKÉ ZÁVODY
Synthesia
S.P. 532 17 PARDUBICE-SEMITIN

Miroslav Janeček

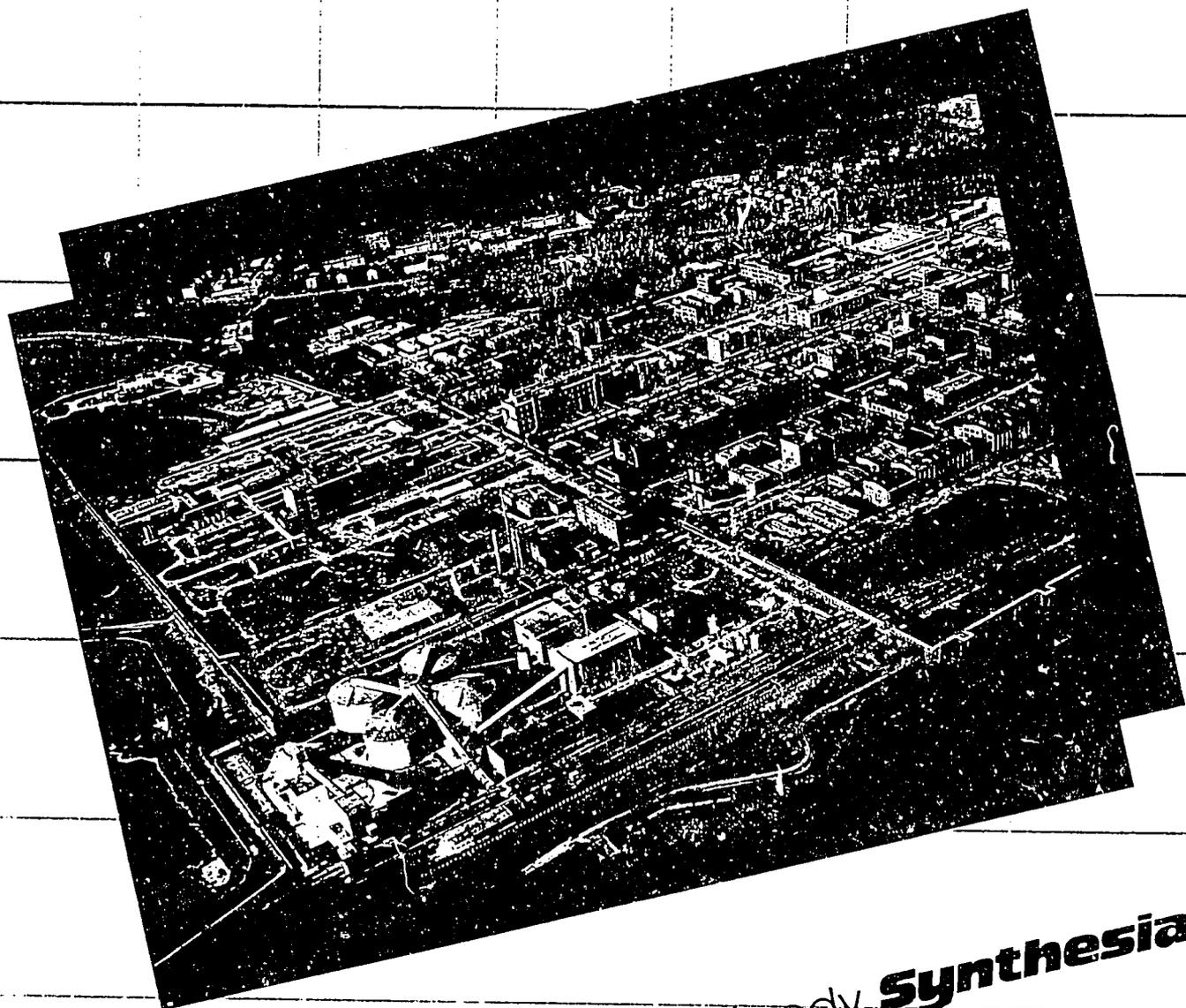
DIRECTOR
FOR STRATEGIC PLANNING

tel +42 40 40385, 492 4400, 493 + linka
telex 196 222, 196 223
fax +42 40 40385, 46455

APPENDIX E - DOCUMENTS RECEIVED

A. SYNTHESIA ANNUAL REPORT

VÝROČNÍ ZPRÁVA ANNUAL REPORT 1992



Východočeské chemické závody - **Synthesia**
s.p. Pardubice - Semtín

Úvodní slovo ředitele

Východočeské chemické závody Synthésia prožily rok 1992 ještě jako státní podnik. Proto bylo jedním z hlavních úkolů připravit privatizační strategii a podle ní zpracovat a předložit privatizační projekt. Transformaci Synthésie na akciovou společnost s následným postupným přechodem na moderní, koncernové uskupení s vytvářením dceřinných společností tam, kde to bude účelné, podpořili kromě vedení podniku i zaměstnanci, reprezentovaní odbory a dozorčí radou.

Pochopili jsme, a to velmi brzy, že nelze čekat na zahraničního investora, který jakoby mávnutím kouzelného proutku, vyřeší všechny problémy Synthésie, pochopili jsme, že nemůžeme přijímat předprivatizační agónii státních podniků jako přirozený proces proti němuž nemá smysl bojovat, pochopili jsme, že osud podniku je jen v našich rukou.

V rámci přípravy na úspěšnou transformaci státního podniku na akciovou společnost, pokračovali jsme v celé řadě aktivit určených k realizaci v roce 1993. Pokračovali jsme v budování akceschopných flexibilních závodů za současného vytváření silných a schopných centrálních aktivit držících firmu pohromadě. Pro rok 1993 byla novelizována pravidla ekonomického řízení podniku. Byla připravena další aktivizace obchodních činností i racionalizace minimalizované investiční výstavby. Zcela jsme změnili a zmechanizovali mzdový systém. Dále jsme pokračovali ve zvyšování efektivity práce.

K uvedení do života v roce 1993 byl připraven soubor základních projektů předprivatizačních aktivit „Nová tvář Synthésie“, jehož základní úkoly jsou:

1. Budování strategie firmy ve vztahu k životnímu prostředí.
2. Zlepšení „image“ podniku.
3. Formulace životaschopné ekonomické politiky.

Úplně bylo dobudováno nové vedení firmy schopné zvládnout přechod k akciové společnosti.

Musíme konstatovat, že se nám nepodařilo splnit všechny úkoly, jež jsme si stanovili pro rok 1992. Přesto mohu na pozadí jak celkového stavu naší národní ekonomiky, tak na pozadí pokračující recese v evropském i světovém měřítku hodnotit rok 1992 pro Synthésii jako úspěšný, mohu jej hodnotit jako rok, který vytvářel dobré předpoklady pro rok 1993, pro rok vzniku akciové společnosti Synthésia.

Rok 1992 byl pro nás koncem staré doby. Rok

Introduction from the General Director

The Eastern Bohemia Chemical Works went through the year 1992 in the form of a state enterprise. Our primary task has been to prepare a privatisation strategy, and to draw up a project accordingly, to be submitted to the Ministry of Privatisation. Full support has been forthcoming from both management and the employees represented by the Trade Unions and the Supervisory Board for the transformation of our state enterprise into a joint-stock company; and for a gradual change into a holding company, with daughter companies where it is appropriate.

It had very soon become clear that there was no point in waiting for a foreign investor to appear who would solve our problems instantly, like a conjurer waving a magic wand. We were also quick to understand that the general pre-privatisation agonising of some of the other larger state enterprises was not a natural process and against which it was useless to fight. Thus we came to conclude that the future of our enterprise was solely in our hands.

In the course of the preparation for a successful transformation into a joint-stock company we have pursued a variety of activities to be implemented in 1993. We have developed a course of building-up a network of strong and flexible Divisions, whilst strengthening those administrative activities which would then cement the company together.

New rules of economic management for the company have been drawn up for 1993. Plans for the revitalisation of both our domestic and foreign trade have been finalised, while a course of minimal capital investment policy has been put into action. Our wage and incentives system has been completely re-aligned, as well as computerized. We are continuing in the direction of increasing productivity.

The "New Face of Synthésia" Project, designed to be put into effect before privatization, has been completed. Their basic assignments to-date have been:

1. The development of a new strategy with regard to the environment.
2. Improvement of our corporate image.
3. The formulation of a revitalized financial programme.

A new top-management team, able to guide us through our transformation into a joint-stock company, has evolved.

It must be said that we did not fulfil all of the expectations we had targeted for 1992. However, after factoring in Czechoslovak economic and political developments, plus the ongoing recession across Europe and throughout the world, 1992 may be considered a year of financial success for Synthésia. A solid basis for 1993, the

1993 znamená začátek nově. Jsme na ni připraveni a těšíme se na ni.

year when Synthesia will once again become a joint-stock company, has been prepared. 1992 marked the end of the old era; 1993 marks the beginning of the new. We are now ready for it, and welcome its coming.

Ing. Jaroslav Valoušek
podnikový ředitel
Managing Director

Profil podniku

VCHZ Synthesia (Východočeské chemické závody Synthesia) byly v roce 1992 státním podnikem se sídlem v Pardubicích-Semtíně. První závod VCHZ Synthesia s úředním názvem „Explosia“ začal výrobu již v roce 1922.

VCHZ Synthesia, jeden z největších českých chemických podniků, se význačnou měrou podílí na produkci základních chemikálií, průmyslových hnojiv, plastů, pesticidů, farmaceutických výrobků, základních organických výrobků a polotovarů, organických barviv a pigmentů, trahvin, bezdýmých prachů a nitrosloučenin.

Všechny výrobní objekty jsou soustředěny cca 5 km od města Pardubic na rozloze 12 000 000 m², z toho 5 066 920 m² plochy oplocené. I v současnosti probíhající investiční výstavba se realizuje na stejném území.

VCHZ Synthesia jsou státním podnikem zřízeným rozhodnutím Ministerstva průmyslu České republiky. Organizační složky VCHZ Synthesie nemají vlastní právní subjektivitu.

Jeho sídlo a adresa je :

Východočeské chemické závody

Synthesia

státní podnik

532 17 Pardubice-Semtín

Identifikační číslo organizace

IČO: 011801

Profile of the Enterprise

VCHZ Synthesia (Eastern Bohemia Chemical Works, Synthesia) was, in 1992, a state-owned enterprise and it is located in Pardubice-Semtín. The first VCHZ Synthesia factory, under the official name Explosia, started production in 1922.

VCHZ Synthesia, one of the largest Czech chemical enterprises, is an extensive producer of basic organic chemicals and intermediates, industrial fertilisers, plastics, pesticides, pharmaceutical products, organic dyestuffs and pigments, explosives, smokeless powders and nitrocompounds.

All production facilities are located about 5 kms from the city of Pardubice, with a total area of approximately 12,000,000 m², of which 5 066 920 m² are fenced. All ongoing production activities are currently limited to this area.

As VCHZ Synthesia was in 1992 a state enterprise established by the Ministry of Industry of the Czech Republic, the Divisions therein have no individual legal status. Administrative offices:

Eastern Bohemia Chemical Works

Synthesia

(State - Owned Enterprise)

532 17 Pardubice-Semtín

Identification number of the Organisation:

011801

Zajištění budoucnosti podniku spočívá v soustředění všech jeho aktivit na oblasti, ve kterých má, nebo může mít konkurenční výhody proti obdobným světovým výrobcům. Hlavním dlouhodobým cílem je postupné vybudování ekonomicky a ekologicky vyváženého podnikatelského subjektu. Prvním krokem je překonání současných problémů daných změnou ekonomických a obchodních vztahů, ekologickou situací výroby a v neposlední řadě optimálním vyřešením privatizace a s ní spojeným organizačním členěním podniku. Při realizaci této vize je předpokládáno omezení řady dnešních činností, rozšíření marketingových a obchodních činností a vznik nových aktivit včetně vstupu cizího kapitálu.

The future of our enterprise lies with the decision to concentrate on those activities where it has a competitive advantage in comparison with similar producers around the world. Our main, long-term goal is for a gradual transformation into an economically, as well as an ecologically, balanced operation. The first step for us to take involves overcoming the present problems stemming from the dramatic changes in the economy, as well as in our business relationships, in the ecological state of our manufacturing facilities and last but not least in finding optimum solutions for privatization and for the restructuring of the company. To reach this goal we will rely on the reduction of a number of current activities, on a redeployment of our resources in marketing and in everyday business as well as the introduction of some new activities including foreign investments.

Strategie budoucího rozvoje

Long - term development strategy

Formulování strategie v roce 1992 vycházelo z hodnocení silných a slabých stránek podniku.

Hlavní silné stránky jsou spatřovány v tradici výroby opírající se o:

- kvalifikovanou a dosud levnou pracovní sílu,
- výhodnou lokalizaci podniku,
- kvalifikované vlastní i regionální výzkumné zázemí,
- vlastní polotovarové zázemí vycházející převážně z vlastních základních surovin a vlastní energetické a ekologické zajištění výroby. K dispozici je i vlastní strojírenská a údržbová základna. Po výrobní stránce je převážná část výrob v ČR dominantního charakteru se značným podílem exportu. Řada zařízení je univerzální a díky volné kapacitě i značně flexibilní.

Slabé stránky podniku jsou spatřovány v existenci řady starších zařízení, v ekologických problémech, v přežívání ekonomické životnosti řady výrob a v nedostatku kapitálových zdrojů. Snažíme se zlepšit naši činnost v oblasti marketingu.

Jedním z hlavních cílů roku 1992 byla příprava privatizace podniku. Byl zpracován privatizační projekt s následnými doplňky, který byl odvětvovou komisí ministerstva doporučen ke schválení. V současné době probíhá jeho hodnocení na Ministerstvu pro správu národního majetku a jeho privatizaci. Očekává se, že založení akciové společnosti bude realizováno cca v polovině roku 1993. Státní podnik bude

The formulation of the strategy for the year 1992 was founded on the evaluation of both the strong and the weak points of the enterprise. Our pillar business is based on our long - lasting tradition in chemical manufacturing, which in turn relies on:

- the still cheap and well - qualified workforce,
- the advantageous location of the enterprise,
- on our own qualified and external research,
- on the assortment of semiproducts produced from our own basic raw materials and energy - generation, as well as pollution - prevention facilities. Moreover, VCHZ Synthesia has its own engineering and maintenance workshops. For the majority of its products VCHZ Synthesia is the main producer in the Czech Republic. Export plays a vital role in our trade. A large number of the manufacturing facilities are of a universal nature and, due to a certain capacity margin, are highly flexible.

Some older equipment and plants still in operation and which have ecological problems, are considered a major drawback. Other issues to be dealt with are the lack of capital resources and the need to replace a number of plants which are nearing the end of their economic life - time. Furthermore, we must accelerate our efforts to improve our marketing activities.

Another objective for 1992 was the preparation for privatization. To that end, a project completed by a number of additions has been worked out. The Chemical Commission of the Ministry of Industry has recommended it for approval, and it is now being examined by the Ministry for the Administration of National Property and Privatization. It is anticipated that a joint - stock com-

transformován do jediné a. s. s následnými kroky na společnost holdingového typu.

pany will have been formed by the end of the first half of 1993. Thus VCHZ Synthesia the state enterprise, will be transformed into one single company which will gradually become a holding corporation.

Základní finanční údaje

Basic Financial Figures

VCHZ Synthesia (v tis. Kčs) (in thous. Kčs)	1992	1991	Rozdil Difference
Výkony Total Revenues	4 633 949	4 983 206	-7,0%
Čistý zisk Net Profit	199 212	274 201	-27,3%
Cash Flow	481 397	620 096	-22,4%
Vlastní jmění Net Worth	5 961 287	5 509 464	+8,2%
Investice Investments	583 639	581 570	+0,4%
Výdaje na výzkum a vývoj R & D Expenditures	120 646	111 521	+8,2%

Počet pracovníků

Number of Employees

Rok Year	1992	1991
Celkem Total	7 503	8 029
Z toho THP Number of Office Staff	1 944	2 054

V roce 1992 z tohoto počtu bylo 7,2% pracovníků s vysokoškolským vzděláním a 12,9% s úplným středním odborným vzděláním (s maturitou). Průměrný věk vedoucích pracovníků podniku a ředitelů závodů je 42,9 roků.

In 1992 the number of employees with University or College education was 7.2%, and 12.9% had graduated from secondary school. The average age of management is 42.9 years

Vedení podniku

Management

Jaroslav Valoušek	- podnikový ředitel Managing Director			
Miroslav Janeček	- náměstek strategického řízení Deputy Director for Strategic Planning			
Zbyněk Holub	- ekonomický náměstek Deputy Director for Economics			
Viktor Vlkovský	- obchodní náměstek Deputy Director for Commerce & Trade			
Jan Roman	- personální náměstek Deputy Director for Personnel			
Jiří Kumstát	- náměstek pro životní prostředí Deputy Director for Environmental Affairs			
Ředitelé závodů		Managers responsible for divisions		
Ladislav Hojecký	- anorganika Inorganics			
Petr Kára	- plasty Plastics			
Vratislav Vojtíšek	- organika Organics			
Karel Palla	- barviva a polotovary Dyestuffs and Intermediates			
Petr Tužil	- výbušniny Explosives			
Petr Říha	- energetika Power Engineering			
Jaroslav Hortlík	- údržba, strojírenská výroba a investice Engineering production, Maintenance and Construction			
Tomáš Král	- Výzkumný ústav průmyslové chemie Research Institute for Industrial Chemistry			

Dozorčí rada podniku

Supervisory Board

Otakar Machač	- Vysoká škola chemickotechnologická Pardubice College of Chemistry and Technology Pardubice
Tomáš Sákra	- Vysoká škola chemickotechnologická Pardubice College of Chemistry and Technology Pardubice
Ladislav Řehák	- Komerční banka Pardubice Commercial Bank Pardubice
Václav Lisý	- Ministerstvo průmyslu a obchodu Praha Ministry of Industry and Trade Prague
Ludvík Šír	- Ostacolor Rybitví
Milan Hrdlička	- VCHZ Synthesia
Karel Bílek	- VCHZ Synthesia
Zdeněk Němeček	- VCHZ Synthesia
Ladislav Dobrkovský	- VCHZ Synthesia
Antonín Kvaček	- VCHZ Synthesia

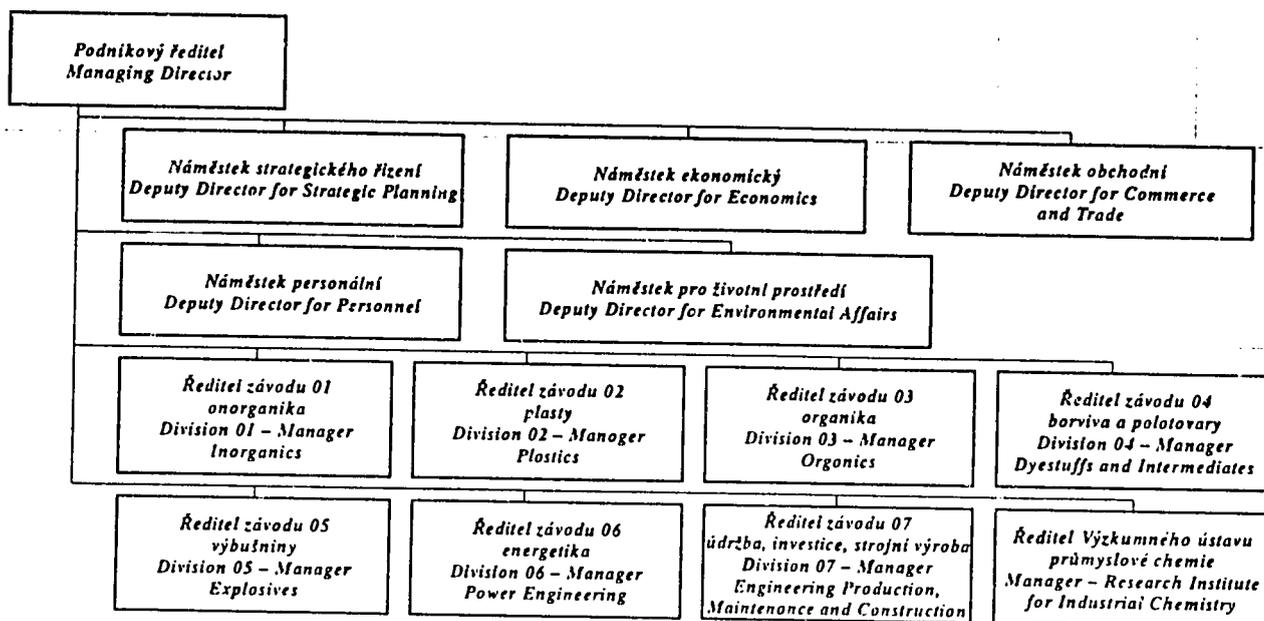
**Majetková účast VCHZ
Synthesie v organizacích**

**Ownership by VCHZ
Synthesia of outside Interests**

Název organizace Name of Company	Majetkový podíl Amount and Percentage of Interest	
	mil. Kčs	%
Chemapol a. s. Praha 10, Kodaňská 46	2,5	1,25
Intes a. s. Pardubice, Milheimova 1010	0,2	5,0
Ostacolor a. s. Rybitví	33,6	48,0
Komerční banka, pob. Pardubice Pardubice, nám. Republiky 222	0,5	0,05

Organizační schéma

Organisation Chart



Chemická výroba

Production of Chemicals

Anorganická chemie

Technické plyny, slabá a silná kyselina dusičná a její speciální druhy, dusičnan amonný hydrofobisovaný a krystalický, dusičnan sodný krystalický, kyselina sírová a oleum, průmyslová hnojiva.

Inorganic Chemicals

Technical gases, diluted and concentrated nitric acid and other specialty types, free-flowing and crystalline ammonium nitrates, crystalline sodium nitrate, sulphuric acid and oleum, industrial fertilisers.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	464 143	319 710
Podíl na celkové chemické výrobě Share of Total chemical Production	10,7%	7,3%
Hlavní skupiny výrobků Main areas of production		
Základní anorganika-kyseliny Basic inorganic-acid	10,0%	7,9%
Anorganické soli-dusičnany Inorganic salts and nitrates	15,1%	14,3%
Průmyslová hnojiva Industrial fertilisers	70,1%	72,2%

Přes pokračující útlum tuzemské spotřeby v zemědělském sektoru se podařilo zvýšit výrobu zejména realizací exportu. V roce 1992 byl podepsán kontrakt s firmou Linde-Technoplyn na výstavbu nové jednotky technických plynů, umístěné v areálu Synthesie. Byla ukončena předběžná jednání o výstavbě výroby koncentrované kyseliny dusičné. Pro limitované množství investičních prostředků byla zpomalena výstavba „Rekonstrukce olea“.

In spite of the continued reduction of domestic consumption in the agricultural sector, we succeeded in increasing production mainly through exports. In 1992 a contract was signed with the Linde-Technoplyn Company for the construction of a new Technical Gases Unit, to be situated on Synthesia's premises. Further, a contract for the construction of a concentrated Nitric Acid Unit has been signed. Because of a limited amount of capital there was a slow-down in the reconstruction of the Oleum Unit.

Plastické hmoty

Lisovací hmoty, technické pryskyřice, pomocné materiály jako ztekucovadla a pojídla, speciální nátěrové materiály, lepidla, technické a dekorativní lamináty, vytlačované desky a folie, Cu-lamináty, impregnované papíry.

Plastic materials

Pressing plastics, technical resins, auxiliary preparations as liquifiers and binding agents, special coating materials, adhesives, technical and decorative laminates, extruded plastic panels and foils, copper-clad laminates and papers impregnated with resins.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	407 411	411 524
Podíl na celkové chemické výrobě Share of Total chemical Production	9,4 %	9,4 %
Hlavní skupiny výrobků Main Areas of Production		
Lisovací hmoty a technické pryskyřice Pressing plastics and technical resins	22,8 %	22,5 %
Technické lamináty a vytlačované desky Technical laminates and extruded panels	43,6 %	41,3 %
Impregnované papíry Impregnated papers	18,4 %	20,9 %
Lepidla Adhesives	3,3 %	5,6 %
Cu-lamináty Copper-clad laminates	4,3 %	3,7 %

Výrobu plastů se podařilo udržet zhruba na stejné výši minulého roku. Nejvýznamější akcí bylo zahájení výroby Cu-laminátů (s názvem Umatex 222) na nové jednotce. Jedná se o vysoce kvalitní nehořlavý sklolaminát plátovaný měděnou folií, který nachází uplatnění v elektrotechnickém průmyslu.

We managed to maintain production of plastic materials at approximately last years level. The most important action was the launching of production of copper-clad laminates in the new unit (under the name Umatex 222). It is a high-quality inflammable glass laminate, clad with copper foil, that finds application in the electronics industry.

Organická chemie

Betanaftol, ftalanhydrid, chlorované a nitrované deriváty benzenu a toluenu, acetocetan etylnatý, fenylmethylpyrazolon, arylidy, fosgen, chlormravenčany, dimetylsulfát, kyselina octová, octan etylnatý, acetaldehyd, etylacetát, eter, kyselina p-nitrobenzoová, barvářské polotovary.

Organic Chemistry

Beta-naphtol, phthalic anhydride, chlorinated and nitrated benzene and toluene compounds, ethyl acetoacetate, phenylmethyl pyrazolone, arilides, phosgene, chloroformates, dimethyl sulphate, acetic acid, ethyl-acetate, acetic-aldehyde, diethyl ether, p-nitrobenzoic acid and intermediates for dyestuffs.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	988 098	1 206 069
Podíl na celkové chemické výrobě Share of Total chemical Production	22,9%	27,4%

Celkový pokles výroby o cca 18% byl způsoben zejména konkurencí dálněvýchodního zboží a pokračující recesí na evropském trhu. Postiženy byly větší měrou základní organické chemikálie, zatímco odbyt složitějších barvářských polotovarů se podařilo udržet na konstantní výši. Pro nedostatek investičních prostředků byla přerušena dostavba nového oddělení barvářských polotovarů a podařilo se zabezpečit pouze některé rekonstrukce.

A total production loss of about 18% was caused mainly by growing competition from the Far East, and the continuing recession in Europe. Basic organic chemicals were most affected, while sales of the more sophisticated intermediates for dyestuffs were maintained at a constant level. The completion of construction of a new plant for intermediates was delayed for lack of capital and only a certain level of reconstruction has been maintained.

Přípravky na ochranu rostlin

Vlastní účinné látky na bázi fosgenu a jejich finalisované formy. Finalisované formy z dovážených účinných látek.

Plant protection

Active substances based on phosgene and their finished forms. Finished forms from imported active substances.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	473 014	725 722
Podíl na celkové chemické výrobě Share of Total chemical Production	10,9%	16,5%

Pokles výroby pesticidů o 35% byl způsoben celkovou čl. situací v zemědělském sektoru. Významnou měrou se též projevil vliv zahraniční konkurence vzrůstem objemu importu již finalisovaných produktů.

The decline in the production of pesticides by about 35% was caused by the general Czechoslovak situation in agriculture. The impact of competition from abroad was felt at a significant level due to increases in the volume of imports of finished products.

Farmaceutické lučebniny

Farmaceutické substance zejména analgetika, vitamín D2, cytostatika.

Pharmaceutical substances

Pharmaceutical substances: mainly analgesics, vitamin D2, cytostatics.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	145 841	189 013
Podíl na celkové chemické výrobě Share of Total chemical Production	3,4%	4,3%

Odbyt je trvale zaměřen převážně exportním směrem. Pro přechodné zastavení výroby vitamínu D2 však došlo ke snížení celkové výroby o cca 23%.

Nová cytostatika spolu s rekonstrukcí výroby farmaceutických lučebnin, která zajistí docílení kvalitativních standartů dle US FDA normy a Správné výrobní praxe, dávají slibné předpoklady budoucnosti tohoto oboru.

Sales are still concentrated on the export market. However, due to the temporary shut-down of the Vitamin D2 facility, production here was reduced by approximately 23%.

Our new cytostatics along with the reconstruction of the entire pharmaceuticals plant will bring us into full compliance with US FDA Standards and Good Manufacturing Practice Codes, with the result of a very promising future for this division.

Organická barviva a pigmenty

Rozpustná azobarviva přímá, reaktivní, kyselá, barviva na kůži, azobarviva nerozpustná jako monoazopigmenty, pigmenty azokondensační a barviva dispersní, barviva antrachinonová a ftalocyaninová, opticky zjasňující prostředky.

Organic Dyestuffs and Pigments

Water soluble azo dyes as direct, reactive, acidic, dyes for leather, water insoluble azo-dyes as monoazo pigments, azocondensation pigments and disperse dyes, anthraquinone and phthalocyanine dyes and optical brighteners.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	1 287 472	1 020 433
Podíl na celkové chemické výrobě Share of Total chemical Production	29,8%	23,2%

Přes značné odbytové potíže se podařilo zvýšit výrobu o 21%. Vývoz barviv v roce 1992 činil 906,4 mil. Kčs a představoval 97% úroveň minulého roku. Východní trhy ztratily svůj původní dominantní význam. Odbyt do zemí bývalého Sovětského svazu poklesl na 18,8% úroveň roku 1991 a činil pouze 2,8% celkového barvářského exportu. Přestože se nepodařilo zajistit odbytiště pro výrobu nové jednotky azokondensačních pigmentů, představuje i nadále značný potenciál pro budoucnost.

In spite of considerable marketing difficulties we succeeded in increasing our production by about 21%. The export of dyestuffs in 1992 was 906.4 mil. Kčs and represented 97% of last year's level. Eastern markets have lost their original dominance. Sales to the former Soviet Union slumped to 18.8% of the 1991 level and made up only 2.8% of the entire dyestuffs export market. Although we failed to secure markets for the output from the new azocondensation pigments unit, it continues to represent great potential for the future.

Výbušiny

Nitrolátky, nitrocelulosa, nitrochipsy, trhaviny, prachy nitrocelulosové, nitroglycerinové, sférické.

Explosives

Nitrocompounds, nitrocellulose, nitrochips, industrial explosives, nitrocellulose and nitroglycerine gunpowder, spherical gunpowder.

Rok Year	1992	1991
Výroba zboží (v tis. Kčs) Production (in thous. Kčs)	556 083	521 828
Podíl na celkové chemické výrobě Share of Total chemical Production	12,9%	11,9%
Hlavní skupiny výrobků Main areas of production		
Nitrocelulosa Nitrocellulose	37,2%	31,4%
Trhaviny Industrial explosives	60,6%	54,1%
Zbrojní výroba Military production	1,5%	13,1%

Podářilo se zastavit negativní pokles výroby z minulých let a dosáhnout 6,6%ního růstu získáním nových trhů a vyhověním vzrůstajícím požadavkům zákazníků. Hlavní podíl měla jak výroba nitrocelulosity tak trhavin, zatímco pokles produktů spojený se zbrojní výrobou pokračoval i nadále. Inovační výzkumná aktivita dává dobré předpoklady vývoje v roce 1993. Je však třeba počítat i s negativními dopady následkem omezení investičních prostředků.

The decline in production over the last few years was turned around and a 6.6% increase was achieved by expanding into new markets and by meeting the increased needs of our current customers. Nitrocellulose as well as industrial explosives had the largest market share, while production for the military continued to decline. However, innovative research and development activities have helped secure a favorable outlook for our market position for 1993. Problems which might arise owing to limited investment must be recognized and counteracted accordingly.

Obchod

Přes pokračující trend v odbytových potížích, jak je zřejmé z poklesu výkonů v roce 1992 na 92,8% roku 1991, podnik udržel tržby z výrobní činnosti na prakticky stejné výši s rokem 1991 (99,7%). Bylo to zejména díky vysokému podílu exportu, který se podařilo přizpůsobit požadavkům světového trhu. Následující údaje ilustrují naši aktivitu v zahraničním obchodu a hlavní teritoria exportu.

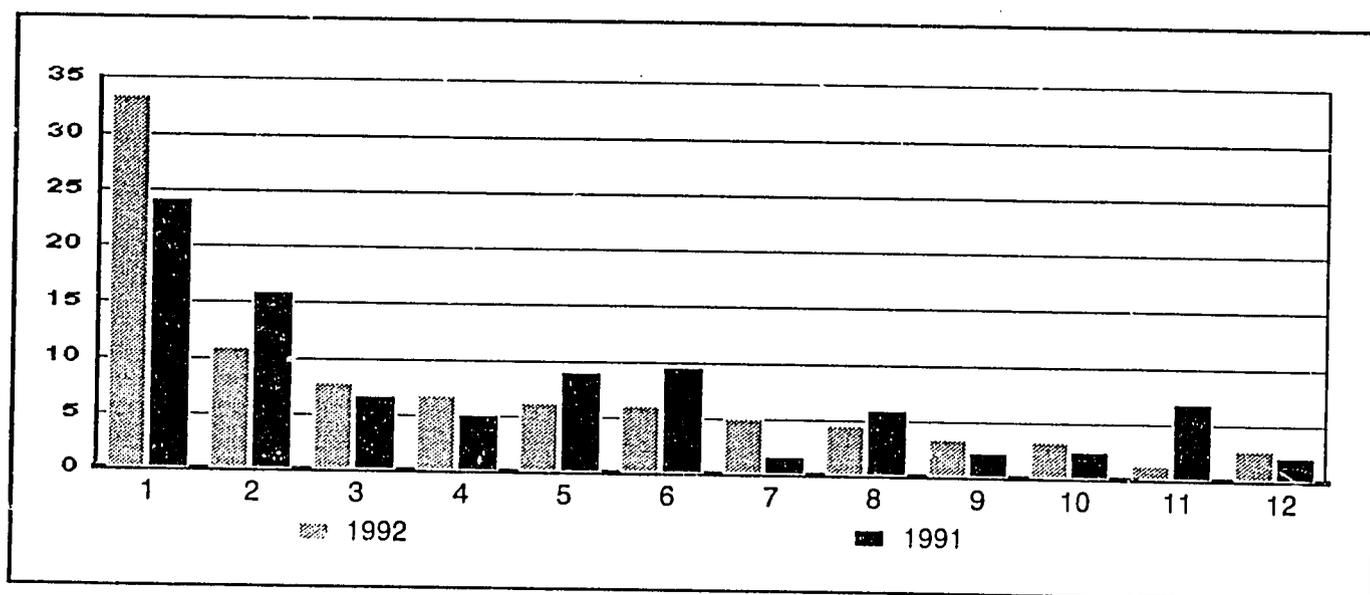
Sales

Despite ongoing recession trends, as seen in a decrease in total revenue in 1992 to 92.8% of 1991, the company maintained sales revenues on a par with that of 1991 (99.7%). This was due to a high export share where we succeeded in adapting to the demands of the world market. The following data illustrate our foreign trade activities and the principal areas of export.

Rok Year	1992	1991
Tržby z výrobní činnosti (v tis. Kčs) Revenue (in thous. Kčs)	4 532 509	4 547 337
Vývoz (vč. realizace přes Ostacolor) Export (incl. through Ostacolor)	1 928 092	1 958 439
Podíl vývozu na tržbách Share of export revenue	42,5%	43,1%

Hlavní odbytová teritoria v % podílu exportu

Most important countries in % export share



Země	Country	Země	Country
1. SRN	FRG	7. USA	USA
2. Holandsko	Netherlands	8. Francie	France
3. Itálie	Italy	9. Turecko	Turkey
4. Velká Británie	Great Britain	10. Španělsko	Spain
5. Rakousko	Austria	11. býv. SSSR	ex.U.S.S.R.
6. Švýcarsko	Switzerland	12. Jugoslávie	Yugoslavia

Odbyt původně směřovaný do zemí bývalého východního bloku je nyní rozptýlen do jiných oblastí. Všechny pohledávky jsou inkasovány v termínech jejich splatnosti. Pokles výroby se zastavil již v roce 1991 a od té doby zůstává na stejné úrovni.

Trade originally intended for the former Eastern Bloc has now been diverted elsewhere. All trade receivables have been collected within their maturity period. The decline in the volume of production stopped in 1991 and since then has remained steady.

Finance

Ekonomické výsledky podniku v roce 1992 nedosáhly všech původně vytčených cílů. Snížení rentability tržeb o 2% na 10,8% bylo způsobeno zejména větším objemem prostředků vynaložených na opravy a údržbu hmotného majetku (nárůst o 49,7 mil. Kčs), likvidací nepotřebného majetku (75,6 mil. Kčs) a nárůstem mzdových prostředků.

Vlastní jmění podniku stoupl o 8,8%, finanční zadluženost klesla o 7,5% a představovala pouze 23,6% vlastního jmění. V průběhu roku 1992 nedošlo ke zvýšení vázanosti prostředků v zásobách ani k nárůstu závazků a pohledávek po lhůtě splatnosti. Podnik do určité míry reprivatizoval rok 1991 a nevybočil z průměru celkového stavu čl. národního hospodářství. Je zřejmé, že pozvednutí interní efektivity vyřazením některých svých neefektivních a neadaptabilních článků má ještě před sebou. V roce 1992 k tomuto cíli ověřoval a přijal v systému ekonomického řízení řadu změn pro zlepšení finanční transparency svých relativně samostatných výrobních a obslužných subjektů.

Ekologie

Pokračuje výstavba biologické čistírny odpadních vod. Byl uveden do provozu model biologické čistírny pro průběžné vyhodnocování čistitelnosti odpadních vod a získání informací pro budoucí provoz čistírny.

V provozu jsou i nedávce stávající čistící zařízení, jako je neutralizace kyselých odpadních vod a retenční nádrží, sloužící k řízenému vypouštění odpadních vod.

Značná pozornost byla věnována snižování obsahu biologicky špatně odbouratelných látek u zdrojů. Tím dojde k významnému snížení obsahu chlorbenzenu a dichlorbenzenu. Obdobně byla rozpracovávána opatření pro snížení obsahu dalších látek v odpadních vodách, především benzenu, toluenu a rtuťi.

Ve srovnání s rokem 1991 došlo ke snížení celkového množství vypouštěných odpadních vod o cca 7%.

Byla uzavřena smlouva se specializovanou organizací na vypracování návrhu monitoringu podzemních vod, vč. návrhu na sanaci, vlivu podzemních vod podniku na recipient. Do provozu byla uvedena nová zabezpečená skládka tuhých odpadů, která vyhovuje všem moderním požadavkům, vč. počítačového zpracování údajů, třídného ukládání, možnosti vytěžení atd.. Použití staré skládky odpadů bylo ukončeno a byl zpracován program její rekultivace.

Financial Performance

As far as the financial performance of the enterprise is concerned no all originally targeted goals have been achieved. Sales efficiency was down by 2% in comparison with 1991, and amounted to 10.8%. This has been caused by the need for more funds for repairs and maintenance of tangible assets (increased by 49.7 million Kčs), more funds for liquidations (75.6 million Kčs) and through an increase in wages. The net worth of the enterprise increased by 8.8% while financial indebtedness decreased by 7.5%. Thus our indebtedness was at 23.6% of our net worth.

The financial means tied up in inventory did not increase through 1992 nor did the liabilities and receivables after maturity. On the whole the company followed along the lines of 1991 and did not diverge from the average course of the Czechoslovak national economy. Clearly we still face the need for enhancement of efficiency. This can best be accomplished by doing away with as many ineffective and unadaptable components and activities as possible. A number of measures aimed at improving the financial stability of some of the relatively independent manufacturing and service divisions were examined and adopted.

Pollution Prevention and Environmental Protection

The construction of the biological waste-water treatment plant is nearing completion. A model for the evaluation of the treatment process has been built. This model will be used to provide data for the operation of the facility.

Existing waste reduction processes are still in operation. These include a neutralization unit for acid wastes, as well as a retention basin for the controlled disposal of wastes. Particular attention is being focused on minimising at source amounts of pollutants with low biological degradability. In this way the content of chlorobenzene and dichlorobenzenes in the discharge will be dramatically reduced. Similar steps will be taken in the treatment of benzene, toluene and mercury as well.

In comparison with the year 1991 the quantity of discharged liquid waste was reduced by about 7%. A contract has been signed with a specialized research body for the working up of a proposal to monitor the quality of underground water and regulate its impact on the aquifer.

A new, controlled, solid-waste dump has been put into operation. This site meets the most stringent requirements for classified dumping, future re-use, computerized processing of data, etc.. The use of the old dump site has been discontinued, and a recultivation program is being prepared.

Podniková teplárna začne používat černé uhlí s nízkým obsahem síry místo dnes zpracovávaného uhlí hnědého, s cílem dosáhnout úrovně emisí daných zákonem v r. 1996.

The company power-plant will start using black coal with a low sulphur content instead of brown coal now in use, with the aim of meeting legal emission levels in 1996.

Výzkum a vývoj

Výdaje byly proti minulému roku zvýšeny o 8,2% a představovaly 2,7% z docílených tržeb. Cca 68% výzkumných nákladů bylo realizováno kapacitami vlastních výzkumných pracovišť, zbytek byl zajištěn v rámci hospodářských smluv s externími výzkumnými ústavami, zejména s Výzkumným ústavem organických syntéz v Rybitví. Výzkumná náplň byla zaměřena na nové výrobky, zlepšení stávajících technologií a výrobků, na problematiku ekologie a hygieny práce. Cca třetina objemu prací řešila problematiku organických barviv a polotovarů, cca 26% objemu úkolů bylo z oblasti výbušnin.

Research and Development

Expenditures for research in 1992 were increased by 8.2% in comparison with the previous year and amounted to 2.7% of accumulated revenue. About 68% of the research funds were consumed by our own research centre. The rest was employed to finance contracts with external research companies, especially the Research Institute of Organic Syntheses, Rybitví. Particular attention was paid to innovative products, updating and improvement of current processes and products, pollution prevention and worker safety. About a third of research funds went into research on organic dyestuffs and intermediates, and about 26% of these funds covered the needs of the explosives sector.

Investice

Přes značné problémy se podařilo udržet objem investic zhruba na úrovni roku 1991. Hlavním zaměřením byly investice zajišťující legislativní požadavky ekologie. Pokračující výstavba biologické čistírny odpadních vod a dokončení skládky tuhých odpadů představovaly cca 68% vynaložených finančních nákladů. Z dalších staveb v pořadí investičních objemů můžeme jmenovat pokračující rekonstrukci olea, dokončení nové jednotky technických laminátů, rekonstrukci odd. polotovarů a jednotku izolace p-nitrotoluenu. Nedostatek zdrojů však podstatně omezil realizaci původně plánovaných dalších akcí.

Investments and the Efficient Sourcing of Funds

We succeeded in maintaining our investment expenditures at about the same level as in 1991. The focus has been on investments which help us meet the pollution - prevention levels mandated by law. The on - going construction of the biological waste -water treatment complex, plus the completion of the solid waste dump, have accounted for about 68% of the total of our investment funds. Other investment efforts consisted of the on-going revamping of the oleum plant, completion of the new copper-clad laminates plant, refurbishment of the intermediates plant, and the construction of a new separation unit for p-nitrotoluene. On the whole the lack of resources has restricted substantially the implementation of other anticipated ventures.

Výsledovka

(v tis. Kčs)

Profit and Loss Accounts

(in Thousands of Crowns)

Rok Year	1992	1991
Tržby Revenues	4 532 509	4 547 337
Změny stavu polotovarů, nedokončené výroby, hotových výrobků a podobně Changes in Semi-Finished Goods, Work in Progress, Finished Goods and similar	101 140	435 869
Výkony Total Revenues	4 633 949	4 983 206
Materiálové náklady Purchase of Materials	-2 851 582	-3 080 824
Přidaná hodnota Added Value	1 782 367	1 902 382
Náklady na práci Labour Costs (incl. Bonuses)	-439 466	-406 225
Ostatní příjmy/výdaje Other Income/Charges	-374 410	-325 666
Hrubý zisk z provozu Gross Operating Margin	968 491	1 170 491
Odpisy Depreciation	-282 185	-345 895
Čistý zisk z provozu Net Operating Profit	686 306	824 596
Úroky Net Interest Expenses	-184 243	-187 370
Zisk před zdaněním Profit before Tax	502 063	637 226
Daň ze zisku Income Taxes	-302 851	-363 025
Čistý zisk Net Profit	199 212	274 201

Vyjádření auditora

Ověření bylo provedeno v souladu s platnými právními předpisy a obecně uznávanými normami ověřování. Zahrnovalo takové testy a postupy ověření, které byly za daných okolností považovány za nutné.

Podle našeho zjištění je majetek vedený v rozvaze k 31. prosinci 1992 v souladu s právními předpisy a předložená rozvaha vyjadřuje správné stavy hospodářských prostředků k rozvahovému dni, zisk za období od 1. 1. 1992 do 31. 12. 1992 v částce 502,063 miliónů Kč je vykázán ve správné výši.

Hradec Králové
20. března 1993

A & CE
Auditoři a znalci
Ing. Ladislav Bém
ředitel

Auditors Report

The Audit for 1992 was carried out in accordance with all generally recognized auditing standards and prescriptions.

According to our findings the assets which figure in the balance sheet as of the 31st of December, 1992, are kept according to all relevant legal prescriptions, and the submitted balance sheet shows trustworthy and correct data regarding the financial situation therein. The profit gained during the period from 1. 1. 1992 to 31. 12. 1992 is in an amount of 502.063 millions Kč which is a correct number.

Hradec Králové
March, 20, 1993

A & CE
Auditors
Ing. Ladislav Bém
Director

Rozvaha

(v tis. Kčs)

Balance Sheets

(in Thousands of Crowns)

Rok Year	1992	1991
A. Čistá dlouhodobá aktiva Net Fixed Assets		
Nehmotná aktiva Intangible Assets	766	203
Hmotná aktiva Tangible Assets	6 315 556	5 870 360
Finanční aktiva Financial Assets	36 300	36 300
Celkem Total	6 352 622	5 906 863
B. Pracovní kapitál Working Capital		
Zásoby Inventory	973 835	1 007 366
Pohledávky Trade Receivables	635 132	814 395
Ostatní aktiva Other Assets	29 220	45 729
Dodavatelé Trade Payables	-377 505	-725 441
Ostatní závazky Other Liabilities	-242 419	-15 078
Celkem Total	1 018 263	1 126 971
C. Čistý investovaný kapitál Net Capital Invested		
	7 370 885	7 033 834
D. Vlastní jmění Net Worth		
Základní jmění Equity	5 176 001	5 175 336
Rezervy Reserves	24 250	14 307
Nerozdělený zisk Net Profit	761 036	319 821
Celkem Total	5 961 287	5 509 464
E. Čistá finanční zadluženost Net Financial Indebtedness		
Střední a dlouhodobé úvěry Medium Long-Term Financial Debts	867 396	1 044 993
F. Čistá krátkodobá finanční zadluženost Net Short-Term Indebtedness		
Krátkodobé úvěry Short-Term Financial Debts	581 892	568 401
Pokladna, běžný účet Cash, Deposits	-39 690	-89 024
Celkem Total	1 409 598	1 524 370
Celkem (D+E+F) Total	7 370 885	7 033 834

APPENDIX E - DOCUMENTS RECEIVED

B. DESCRIPTION OF PLANT AND WASTES DISCHARGED

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TERMS OF REFERENCE

VCHZ SYNTHESIA

Pardubice

BACKGROUND

The following summary of the history of the company is given in order to provide consultants with the background to the project to which this tender relates. Consultants may wish to obtain further information by contacting the nominated company manager directly or by arranging to visit the enterprise (see page 13 in the Tender dossier)

- 1 Founded in 1922 for the production of explosives, VCHZ Synthesia is now one of the leading chemical producers in the Czech Republic. It is situated 4 km from Pardubice on a site of 12 million sq. m. and has approximately 7500 employees.
- 2 Synthesia has a wide product range and production is organised into a number of divisions, they are:
 - Inorganic chemistry;
 - Plastics;
 - Organic chemistry;
 - Dyestuffs and Intermediates;
 - Explosives;
 - Power engineering;
 - Maintenance, Engineering Production, Investment.

In addition there is a Research Institute of Industrial Chemistry on the same site.

The turnover for each of the divisions is given in Table 1 and the main product areas are listed in Table 2.

- 3 The enterprise is currently profitable and had a turnover of ?? million Kč in 1992. Financial details for the years 1989 - 1992 are given in Table 3.
- 4 The enterprise is due to be privatised in the second wave of privatisation. In the meantime the enterprise is holding discussions with a number of potential foreign partners. Because of the nature of the business it is necessary to have an independent environmental audit.

5 There are three sources of pollution, they are:

- water pollution
- air pollution
- solid and liquid waste

Water Pollution

Synthesia is the biggest contaminator of the Elbe river in East Bohemia. During the period 1989 - 1991 the total volume of contaminated water was about 34 million cu m per year. Sulphates were approximately 22,000 t/year; chlorides 12,000 t/year; phenols 90 t/year and mercury 0.9 t/year.

The amount of biological oxygen demand in the course of five days (BOD5) varied between 5 and 7 thousand tons of oxygen per year.

Waste water is divided into three sewer systems:

System A - waste water into Elbe river through a setting reservoir without any treatment - 96% of waste water;

System B - waste water into a neutralisation treatment plant and then into system A - 4% of waste water;

System C - waste water through a retention reservoir to control outflow - 2% of waste water.

Currently there are two sewage disposal plants, a neutralisation plant, two waste reservoirs and a bio-aceration plant.

Air Pollution

At present the enterprise produces approximately 20,000 tons of emissions per year. They come from power plant and from technological equipment. In 1991 the emissions were:

Power Plant	t/yr	Tech. Eqpt.	t/yr
Light ashes	2,670	Solid emissions	43
SO	11,951	Gaseous emissions	2,279
NO	3,419		

Technological emissions are from approximately 300 vents and comprise mainly sulphur dioxide (418 t/yr); nitrogen oxide (141 t/yr); methanol (434 t/yr); diethylether (230 t/yr); naphthalene (177 t/yr); methyl chloride (85 t/yr) and benzene (67 t/yr).

Equipment for waste disposal is installed in approximately 50% of the vents.

Solid and Liquid Waste

The enterprise produces 220,000 tons of solid waste per year which is put on dumps or burned. Liquid waste is disposed of in incinerators.

The enterprise has three incinerators, one for the combustion of liquid chlorinated derivatives, one for the destruction of liquid waste lyes from the production of Olachindoxe and the third one for combustion of flammable and explosive waste.

There are six dumps for the storage of chemical and non-chemical waste. Building scree, ash and slag from the power plant and wood waste are stored on non-chemical waste dumps. Chemical waste dumps comprise gypsum, from the neutralisation treatment plant, the non-safe dump of beta-pitch waste and the non-safe dump for storage of non-classified solid waste from chemical production. In addition there is one dump which is not used and has been covered with earth.

- 6 There are a number of projects currently in progress, they include:

Sewage Purification

- a neutralisation treatment plant to treat waste water from sulphuric acid production
- technological changes to reduce the amount of dichlorobenzene and nitrochlorobenzene in waste water;
- a new bio-aeration plant;

Emissions Decrease

There have been some initial investigations into the possibility of reducing the emissions from the enterprise power plant over a five year period.

By 60%

Liquidation of Solid Waste

A new safe dump for hazardous waste, with a capacity of 104,000 cu. m., has recently been commissioned. No consideration is currently being given to make the beta-pitch waste dump safe.

- 7 A number of financial charges are currently paid, these relate to:

- waste water discharge;
- consumption of Elbe river surface water;
- water pollution penalties;
- subsidy for purification of Kolín city drinking water;
- air pollution;
- agricultural and wood damage;

fees
→
jurisdiction

LIST OF MAIN PRODUCT AREAS

1. Inorganic chemicals
2. Pure chemicals
3. Technical gases
4. Explosives
5. Industrial fertilizers
6. Agrochemicals
7. Basic organic chemicals
8. Organic products and intermediates
9. Organic dyestuffs, pigments and color concentrates
10. Plastic materials, polycondensates, polymers
11. Synthetic resins and adhesives
12. Thermal and electric energy
13. Preparations for alimentary industry and fodder resources
14. Special chemicals and preparations

APPENDIX F - PROFILE OF VOLUNTEER SPECIALIST

JOHN B. COLEMAN, JR.
Senior Consultant

Experience Summary

John Coleman's thirty-year career with DuPont has included manufacturing, business, safety, and environmental management experience. He joined Safety and Environmental Management Services as a senior consultant in 1993, having spent the preceding five years in the Corporate Environmental Group. He has extensive experience and expertise in resolving safety, health, and environmental issues for DuPont and has been highly regarded as an industry leader and spokesman on several external issues.

John started his career at the DuPont Company's Memphis plant in 1962 and was one of the company's earliest plant environmental coordinators. He gained experience in plant technical, field sales, business analysis, contract administration, manufacturing management, and safety, health, and environmental management at the departmental level, prior to his corporate assignments.

Credentials

BA and BS, Mechanical Engineering, Rice University, 1959; Registered Professional Engineer, Tennessee.

Areas of Specialization

Environmental policy development, regulatory issues resolution, and auditing; setting of pollution prevention objectives; development of measurement techniques for continuous improvement of environmental programs; familiar with TSCA, RCRA, Clean Air and Clean Water Act requirements.

Some accomplishments from John's career include the following:

- Managed the development of Corporate Groundwater Policy, resulting in the DuPont Company's proactive commitment to groundwater protection and to site remediation programs.
- Led development of worldwide environmental incident reporting system, providing incentive for continuously improving environmental performance.
- Represented DuPont on Water Quality 2000 Steering Committee, which developed steps to improve protection of surface water and groundwater.
- Directed defense of underground injection of hazardous wastes as viable form of waste management.
- Represented DuPont on Steering Committee of Formaldehyde Institute during critical period when the Federal Consumer Product Safety Commission was attempting to ban manufacture and use.

Career History

- 1993-Present* Senior Consultant, Safety and Environmental Management Services, Wilmington, Delaware
- 1992* Manager, Corporate Environmental Affairs, Wilmington, Delaware
- Replaced retiring director of Environmental Affairs to manage a group of five environmental issues consultants; reported to the vice-president, Safety, Health, and Environmental Affairs.
- 1988-1991* Manager, Corporate Environmental Issues, Wilmington, Delaware
- Leadership of specific issues such as underground injection of hazardous wastes, groundwater policy development, and development of an environmental incident reporting system worldwide.
 - Supervisory responsibility (1991) for four environmental consultants.
 - Secretary for senior management Environmental Leadership Council.
- 1985-1988* Manager, Safety, Health, and Environmental, Freon® Business-Chemicals Sector, Wilmington, Delaware
- Resource for all Freon plants worldwide in implementing safety, health, and environmental programs.
 - Corollary corporate assignment as leader for regulatory defense of underground injection of hazardous wastes.
- 1982-1985* Manager, Manufacturing, Methanol Products Business-Chemicals Sector, Wilmington, Delaware
- Manufacturing strategic planning for methanol, tetrahydrofuran, and other chemical production worldwide.
 - Continued liaison for joint venture described below.
- 1979-1982* Special assignment to Director, Methanol Products Business-Chemicals Sector, Wilmington, Delaware
- Primary liaison responsibility to Syngas joint venture with National Distillers, USI.
 - Contract administration for joint venture agreements and for all associated service contracts for Deer Park, Texas, Syngas plant.
- 1978-1979* Manager, Safety and Occupational Health, Industrial Chemicals Department, Wilmington, Delaware
- Responsible for safety and occupational health programs for 20 domestic plants and for influencing regulatory issues affecting the department.

- 1976-1978** **Manager, Environmental, Industrial Chemicals Department, Wilmington, Delaware**
- Responsible for monitoring departmental regulatory compliance and for influencing anticipated regulations.
 - Managed group of three environmental consultants.
- 1973-1976** **Production Superintendent, Repauno Plant, Industrial Chemicals Department, Gibbstown, New Jersey**
- Responsible for unit operations for nitric and sulfuric acid, aniline, and sodium sulfite.
- 1962-1973** **Various assignments in power and environmental engineering, chemical process engineering and supervision, union and labor relations, field sales to adhesives and paper industry, and departmental financial analysis including locations at Memphis, Chicago, and Wilmington.**
- 1959-1962** **U.S. Navy, West Coast, USA**
- Engineering and Deck Division Officer on two different aircraft carriers.
 - Completed active duty obligation June 1962.

Selected Accomplishments

Water Quality 2000 Steering Committee

John represented DuPont on the Water Quality 2000 Steering Committee. This unique coalition of 84 diverse interest groups issued a 1992 consensus report on steps for improved protection of national surface and groundwater.

Underground Injection

John directed the seven-year successful defense by the DuPont Company of underground injection of hazardous waste as a viable form of waste management. The practice was faced with a potential 1988 ban by the Environmental Protection Agency. John participated as DuPont representative in the Federal Advisory Committee regulatory negotiation process, resulting in strengthened regulations. The result was a savings for DuPont of several hundred million dollars versus alternative treatment methods.

Safety Guardian Committee

As organizer and leader of the DuPont hydrofluoric acid (HF) Safety Guardian Committee, John helped to ensure and improve plant and public safety and to further preserve the company's ability to manufacture, handle, and ship HF. Industry standards developed by this committee have been referenced by EPA as an industry Best Practice in a report to Congress.

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