Tiszai Vegyi Kombinát Rt.

# HEALTH, SAFETY & ENVIRONMENT REPORT

2001

# Contents

# Letter by the Chief Executive Officer

## *To Our Customers and Partners*

Man and environment continue to be treated as the intrinsic values of corporate philosophy. To complement our efforts at minimising the impact on the environment, improving the labour and environmental security and safeguarding the health of our employees are given high priority. Our actions in the past year were also driven by the aspiration to reduce this principle to practice in full.

The past year was a year of turbulence for the company. In order to stay focused on core business and to strengthen our market positions, the company was streamlined in the main in 2001 by divesting most of the plastic processing subsidiaries, which had been set up as independent operations in 2000. These measures have helped us concentrate our financial and intellectual resources on developing our core business, the petrochemical operation. Preparations for the development started already in 2001. We drafted the plans required to obtain the environmental licenses from the competent regional authority for constructing a new olefin plant and for intensifying the Polypropylene-4 plant, which were issued in due course for both projects. Our strategic development plans also call for constructing a new polyethylene plant.

We intend to install and operate technologies that meet "Best Available Technique" requirements in each of the budgeted capacity expansion projects, which will double the present performance of TVK once commissioned by year end 2004.

Issued since 1997, our annual Environmental Reports kept giving regular account of the measures we targeted at health, labour safety and the environment.

Implementing the new developments is also expected to improve the environmental performance of our Company, which we managed to enhance also in 2001, when, continuing the favourable trend of previous years, the Company generated 15% less hazardous waste. Our excellence in labour safety was recognised by the selection of Tiszaújváros as the venue of a three-day conference on disaster prevention under the auspices of UN EEC in October 2001, which also included a spectacular disaster prevention drill for conference participants at the TVK Olefin plant.

Motivated by the desire to implement the goals formulated in our environmental policy, we are exerting uninterrupted effort to minimise the impact of our activities on human beings and the environment through the efficient operation of our Environmental Management System, which was subjected to certification yet again in 2000.

Tiszaújváros, June 11, 2002

**József Molnár**
Chief Executive Officer

## *Environmental Principles*

- Our activities and strategy are developed to comply as much as possible with the requirements of sustainable development.
- Prevention, responsible thinking and full compliance with laws are identified as objectives in our environmental policy.
- Economic and production interests may not be given priority over interests related to health, safety and the environment.
- We are committed to the continuous improvement of labour safety and the protection of health and the environment. We are aspiring to increase and deepen the awareness of labour safety, health and environmental protection issues and to develop environmentally conscious behaviour among all our employees.
- Environmentally conscious conduct is one of the criteria in partner selection.
- We are endeavouring to engage in open dialogues with all reputable opinion leaders that are committed to the cause of the environment so as to be familiar with each other's opinions, to exchange ideas about improving the quality of the environment and to boost confidence in our business.

# Environmental Policy

In order to reduce the environmental impact of our operation, since the 1970s we have implemented several projects in environmental protection, have improved the environmental awareness of our employees, have been making efforts to realistically inform the public about our environmental situation and the implemented and contemplated actions to reduce harmful emissions.

Motivated by our achievements, the commitment to the cause of environmental protection as well as the recognition that the protection of the environment together with the development and continuous quality improvement of environmentally friendly products is at the same time crucial to profitability and competitiveness, we developed an Environmental Management System in compliance with ISO 14001 in 1996-1997 and had it successfully certified in December 1997. After three years of effective operation, the system was re-certified in December 2000.

On the basis of our achievements, we consider it to be our most important task for the future to continuously improve the performance of our Company in environmental protection and to comply with the fundamental principles of sustainable development, and to that effect we intend to:

- fully observe the legislative provisions on environmental protection, the requirements prescribed in the respective standards and by the official authorities;
- continue to reduce the environmental loads of our operation systematically;
- improve energy efficiency;
- eliminate earlier environmental harms;
- comply with safety requirements, prevent accidents that are potentially harmful to the environment, and eliminate harmful environmental impacts;
- apply the "Best Available Technique" and take full account of environmental aspects in the implementation of new production technologies, the modernisation or removal of existing technologies and product development;
- support research with a view to minimising feedstock consumption, reducing the harmful environmental impacts of manufacturing processes and enabling the utilisation and recycling of waste products;
- train and motivate our employees to take responsibility for and be committed to environmental protection in the course of their work;
- inform all stakeholders by publishing annual environmental reports among else;
- have our environmental policy endorsed by our suppliers and trade partners to tailor their environmental performance to the Company's broader objectives.

Tiszaújváros, July 6, 2001

**József Molnár**
Chief Executive Officer

# Company Overview

Established in Tiszaújváros in 1953, Tisza Chemical Group Company (TVK Rt.) is the single manufacturer of polyolefin products in Hungary and a leading supplier of polyethylene and polypropylene in the Central and East European region. The Company also plays a significant social role in Tiszaújváros and its environs. Operating as a company limited by shares since December 31, 1991, TVK today accounts for 20 percent of the petrochemical capacities in Central Europe.

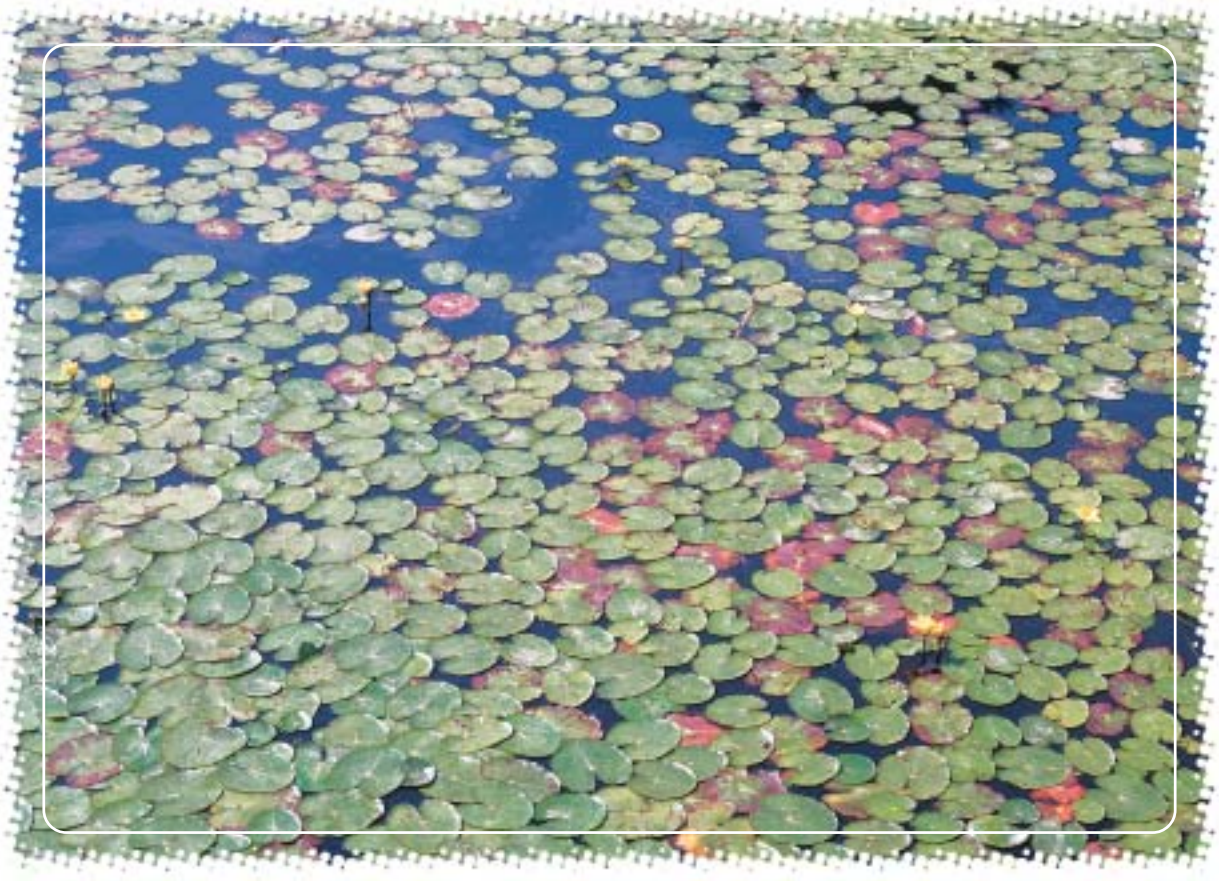
Our products are sold in more than 40 countries and about 50 percent of our exports are targeted to European countries. We are a major ethylene supplier of another large chemical company, BorsodChem Rt. also located in County Borsod-Abaúj-Zemplén and we also have strategic relations with MOL Rt. which is at the same time our most important feedstock supplier.

Based on a new strategy adopted in 2001, TVK's core business is in the manufacture of olefin monomers (ethylene and propylene) and polyethylene and polypropylene granules. The output of petrochemical business will largely be expanded with the construction of an olefin plant of 250 kt per annum and a high-density polyethylene plant of 200 kt per annum in 2005. The new technologies will satisfy the requirements of the "Best Available Technique".

*HDPE Plant*

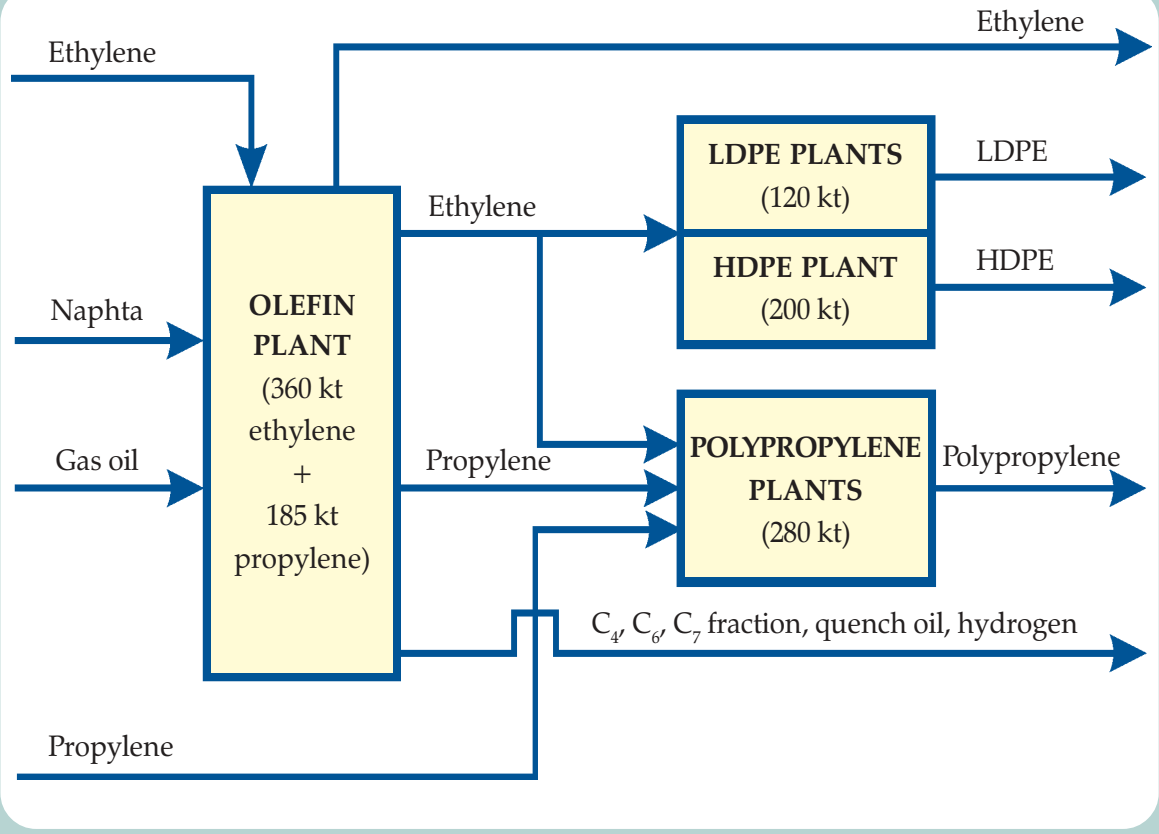
## *Site Data*

- TVK Rt. operates from a single site in Tiszaújváros. The data contained in the environmental report refer to that site.
- The plants are located 1.5 km south of the residential area of Tiszaújváros and west of the River Tisza.
- MOL Rt.'s Tisza Refinery lies south and the Tiszapalkonya AES Tisza Power Plant is east of the site.
- The site is about 5 $km^2$. Residential areas are at a distance of more than 1 km from the fences of the site, hence the required protection zone is observed in all directions.
- The industrial water required for the technologies is supplied from the River Tisza via the water works of the adjacent Power Plant.
- Cleaned effluent and rainwater is also discharged to the River Tisza directly or through the Sajó channel crossing the site.
- In accordance with the prevailing regulation, the site is classified in Category IV with regard to surface waters (irrigation water reserves).
- In respect of air protection, the general technological emission limits are applicable to the emission sources of the site in accordance with the government decree No. 21 (February 14, 2001) effective as of July 1, 2001 and its implementation decrees, with the exception of pyrolysis furnaces which are governed by specific technological emission limits under a joint decree of the Ministry of Environment, the Ministry of Health and the Ministry of Agriculture and Regional Development No. 25/2001 (December 7, 2001).



## *Production Process*

*Outline of the Main Processes of the Petrochemical Business*




**CRACKING**

This process involves the application of heat to decompose a variety of hydrocarbons, primarily naphtha and atmospheric gas oil, and the separation of the resulting gas mixture into **ethylene** and **propylene**. In addition to the products used as feedstock for the production of polyethylene and polypropylene, the process also generates significant quantities of a variety of hydrocarbon fractions.

**POLIMERISATION**

Polymerisation is a process where thousands of monomer molecules (e.g. ethylene, propylene) are bonded under appropriate (temperature and pressure) conditions (in the presence of catalysts and initiators) to form polymer chains. Following this, a variety of additives (stabilisers, antioxidants, master-batches, etc.) are blended and homogenised to extrude natural or coloured end products, i.e. different sorts of **polymer granules**.

**POLYETHYLENE AND POLYPROPYLENE**

Our Company produces low-density polyethylene (LDPE), high-density polyethylene (HDPE) and polypropylene (PP) **as raw materials for the plastics processing industry.** The various types of granules with different technical parameters are used to process a wide range of plastic products from packaging materials to moulded household items that are meant to make our life simpler and more comfortable.

Our plants are operated by computerised process controls. The material flows blown down from closed technologies are discharged through flare systems and are decontaminated by burning at a height of 60-80 metres.

# *Our Products*

Low-density polyethylene, high-density polyethylene and polypropylene granules are marketed under the tradenames TIPOLEN, TIPELIN and TIPPLEN, respectively.

As one of their major advantages, they do not contain any components that are harmful to the environment or health, their wastes can be recycled and they only release carbon dioxide and steam when incinerated.

The lifecycle of polyethylene and polypropylene products largely depends on the areas of application. Foil-type packaging materials are disposed as wastes after a single use while rigid containers (bottles, cans, drums, etc.) are suited for multiple uses. The automobile industry increasingly uses polypropylene components and chassis parts with the same lifecycles as the automobiles, and their wastes can also be recycled.

In order to maintain its market positions and improve the competitiveness of its products, TVK set up quality assurances systems and had them certified under MSZ EN ISO 9001 for all the technologies and product groups as early as the first half of the 1990s.

As a recognition of our efforts in the field of quality assurance, the Company won the National Quality Award in the large company category in 1998 and the "Recognised for Excellence in Europe" title in the European Quality Award competition in 2001.


*Packaging Plant of Polypropylene-4*

*PP-4 Plant Put in Service in 2000*

## *Data and Results*

*Following are the Most Important Operating and Business Data for 2001*

| | | | | |
|---|---|---|---|---|
| **Feedstock used** | naphta | | 944.7 | kt |
| | atmospheric gas oil | | 99.8 | kt |
| **Products sold** | ethylene | | 88.3 | kt |
| | own polypropylene | | 0 | kt |
| | purchased polypropylene | | 3.1 | kt |
| | other olefin products | | 348.4 | kt |
| | LDPE products | | 107.4 | kt |
| | HDPE products | | 187.3 | kt |
| | PP products | | 262.4 | kt |
| **Financial data** | operating profit | HUF | 9.4 | Billion |
| (IAS, consolidated, | profit before interest and taxes | HUF | 7.0 | Billion |
| audited) | net profit | HUF | 8.7 | Billion |
| | capital expenditure | HUF | 6.4 | Billion |
| **Headcount** (Dec 31, 2001) | | | 2,185 | employees |

# Environmental Protection

## *Management of Environmental Protection*

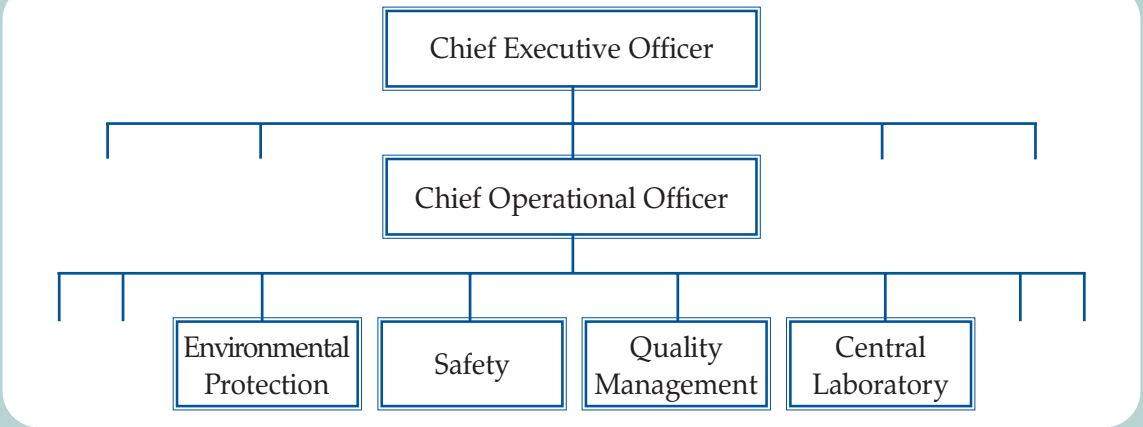
An independent organisational unit (Environmental Protection) reporting to the Company's Chief Operational Officer is in charge of managing our environmental activities. The mandate of Environmental Protection covers all operations and business areas of the Company from environmental aspects.

**The Environmental Protection unit**

- represents the Company in environmental matters vis-á-vis the official authorities,
- supervises and controls full compliance with environmental requirements at the corporate level,
- co-ordinates the operation of the Company's Environmental Management System, carries out the related controls and audits, and liaises with the certifying organisation,
- participates in the preparation of the environmental chapter of the Company's business plans,
- comments on the capital expenditure and revamp proposals, and plans and monitors their implementation from environmental aspects,
- co-ordinates environmental impact studies and controls, and performs the functions related to environmental licences,
- organises the contamination of polluted areas and all actions necessary for environmental rehabilitation.

In addition to Environmental Protection, the Chief Operational Officer acting on behalf of the Company's management also supervises and co-ordinates the Safety unit in charge of labour, fire and operational safety, the Quality Management unit responsible for quality issues and the Central Laboratory performing environmental tests. This structure ensures the co-ordinated management of environmental, safety and quality functions at the corporate level.

*The Positions of the Aforesaid Units in the Corporate Hierarchy*



## *Environmental Management System*

The Environmental Management System (EMS) certified under ISO 14001 and operating since 1997 serves as an extremely effective tool in the implementation of the Company's environmental objectives. In addition to enabling us to continuously reduce environmental impacts, it has been used to improve our employees' environmental awareness and commitment to the protection of environment.

The EMS is used to break down all corporate functions related to environmental protection to individual units and employees, to control and document all processes from environmental aspects, and facilitates collective thinking and an active involvement of the staff in the effective elimination of environmental problems, the mitigation of environmental impacts and ultimately in the improvement of environmental efficiency.

The EMS covers the entire operation of the Company. The environmental policy, the regularly updated EMS manual, procedures and instructions describe the concrete objectives, tasks, the technical, legislative and official requirements of implementation, responsibilities, timetables, instruments and control programmes, creating the conditions for the successful achievement of the objectives declared in the environmental policy.


TÜV Rheinland/
Berlin-Brandenburg

TÜV

CERTIFICATE

The Certification Body for Environmental Management Systems
of TÜV Anlagentechnik GmbH
hereby certifies that the enterprise

TISZAI VEGYI KOMBINÁT RT.
Pf.: 20.
3581 Tiszaújváros
Hungary

has established and applies an environmental management system for

Manufacturing, sale of petrochemical products,
polymers, PE- and PP-pellets as feedstocks

The audit was performed.
Report No. 7086

Proof has been furnished, that the requirements according to

ISO 14001 : 1996

are fulfilled.

The certificate is valid in conjunction with the main
certificate until January 2004

Certification Registration No. 09 104 7086 / 1

As an evidence for the efficient operation of the EMS, the official audit by TÜV Rheinland in January 2002 found the system fully compliant with the requirements although they had become more stringent in the meantime.

## WATER PROTECTION

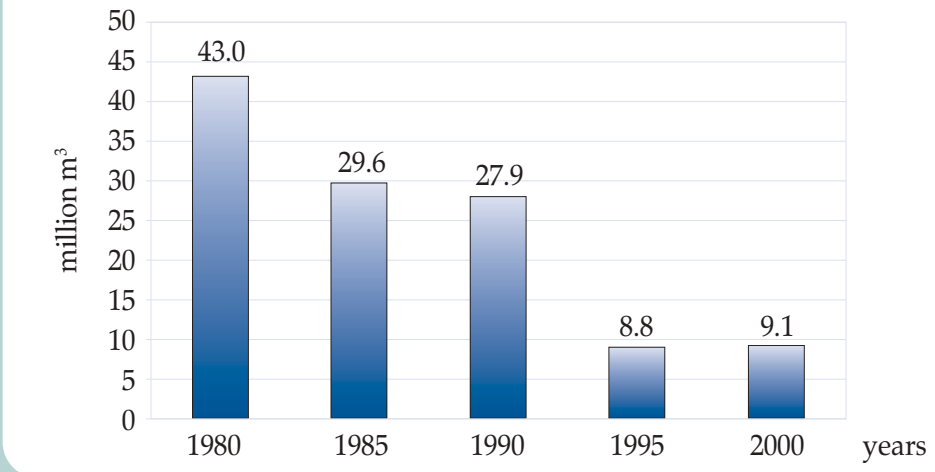
TVK has a substantial water consumption. Most of the industrial water is used for cooling, i.e. extracting the reaction heat generated in the course of chemical processes, thus balancing and optimising technological processes.

The extracted heat volume has stabilised at 10-12 PJ* per annum since the 1970s, using over 200 million $m^3$ of cooling water each year.

**Our industrial fresh water consumption was 9.1 million $m^3$ in 2001.** To reduce water consumption, recirculation cooling towers were already built when the fertiliser plant was commissioned in 1965, however they did not provide for an adequate treatment of the cooling water which made multiple recirculation impossible, and therefore water consumption was still high.

In the 1980s, actions were taken for the chemical and biological treatment of recycle water using up-to-date additives as well a the continuous cleaning of excess water and the partial cleaning of recycled water by filtering in all recirculation coolers. As a result, our industrial fresh water consumption was reduced from 40 million $m^3$ per annum in 1980 to 10 million $m^3$ per annum by the second half of the last decade while cooling capacities remained unchanged. Thus the possibilities of further reduction had been practically exploited.

*Industrial Fresh Water Consumption from 1980*




At the low water discharge of 100 $m^3$ per second of the River Tisza, the present fresh water requirement of 1,000-1,500 $m^3$ per hour represents approximately 0.3 percent of the water discharge which is insignificant compared to the overall water volume of the river.

** 1 PJ = 1 Petajoule = $10^{15}$ J*

After the new olefin and polyethylene plants are completed in 2004, water consumption is expected to rise by about 40 percent, meaning an approximately 0.12 percent higher water intake from the Tisza River.

Since the coal-fired power plant in nearby Tiszapalkonya will be closed down at the end of 2003, the overall water intake from the River Tisza will drop by 3 percent in the Tiszaújváros region despite the increased consumption at TVK.

In order to protect the quality of water used, TVK has been operating a sewage treatment plant of biological grade since the 1960s and has constructed a separation canal network for the collection and disposal of used water and sewage.

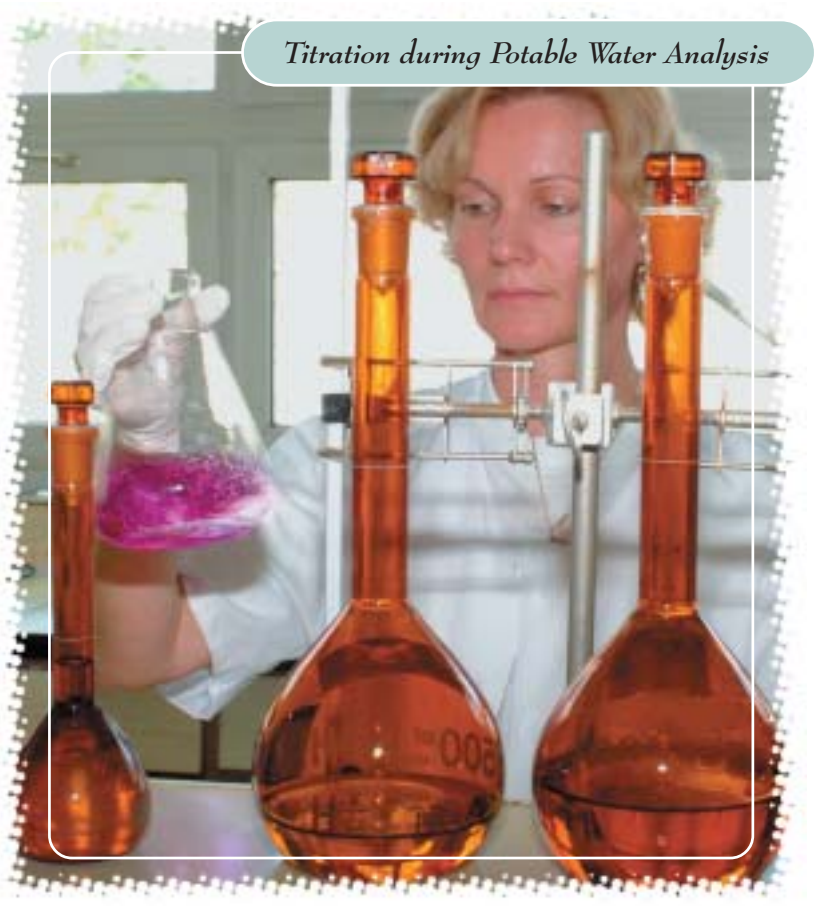
The sewage treatment plant which has been expanded and modernised continuously to meet the actual load conditions has always satisfied the official requirements regarding the quality of the discharged water in the history of TVK.

The major expansion of the system in 1974 also included the construction of ponds used for the additional biological cleaning and safe storage of treated sewage for the first time in the industry, which ultimately serves the protection of the recipient River Tisza.

Rainwater and non-polluted industrial water is discharged from the site into the Sajó Channel with several sluices before its influx into the River Tisza serving to prevent the elevation of the water level in the channel at times when the River Tisza floods and to hold back and treat any pollutants that may be discharged in the case of accidents. It helps to reduce harmful effects jeopardising the water quality in the River Tisza to the minimum.

**We reviewed the Company's water management and water system to improve the protection of the River Tisza and as part of the environmental licensing procedures in relation to the additional water demand and the expected discharges of the proposed strategic capex projects, and prepared a new water management concept which is attached to the detailed environmental impact studies of the proposed projects.**

**The concept describes the ways and conditions of water supply, the possibilities of minimising additional water demand, and the effluent levels in the long run.**



*Titration during Potable Water Analysis*

In order to reduce the salt concentration in the effluent, the water management concept includes a commitment to replace the current ion-exchange technology with an RO technology based on membrane technology to ensure the ion-free water supply for the production technologies and to create the conditions for minimising the amount of lye used in the cleaning of pyrogas at the olefin plant and for reducing the salt released from the technology.

At present, the salt release containing natural salt components (Ca, Mg, Na and K salts) is 8,000-9,000 kg per day. This quantity increases the salt concentration of the river of 300 mg per litre by 1.1 mg per litre at the aforesaid water discharge of 100 $m^3$ per second and the Na ion content by 0.64 percent. Such loads have no significant impact on the ecological conditions of the River Tisza. To prevent that the strategic projects release higher salt volumes, an up-to-date sewage treatment plant operating on the basis of the "reverse osmosis" principle will be built to supply ion-free water to TVK and to the combined cycle power plant that will replace the Tisza power plant soon to be closed down. After the new plant is built, it will be possible to discontinue the present sewage treatment technology which is based on ion exchange and thus releases large volumes of salt.

It is to be noted that an air cooling system will be used to extract technological heat at the power plant, hence its water consumption can be kept at a minimum.

A decision has been made to upgrade the sewage treatment plant with construction work to be launched in 2002.

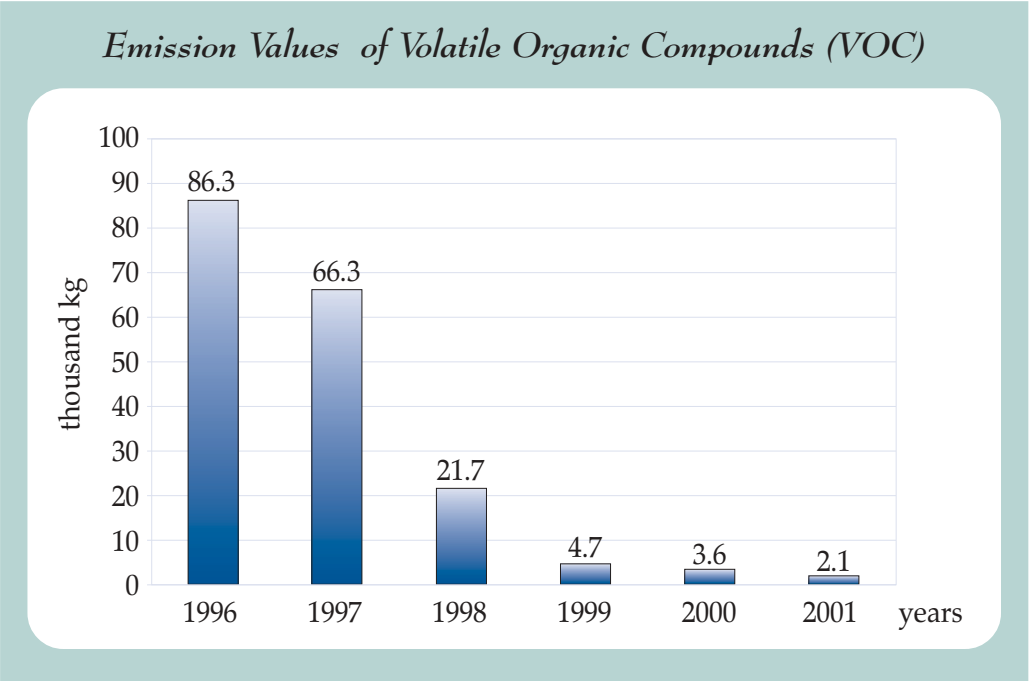
The concept also includes measures to reduce water consumption and protect water quality. As a result of the proposed measures, TVK will comply with both the national and the European water management, water quality and water protection requirements in the field of quantitative and qualitative water protection.

*Fragment of Post-Treatment Pond of TVK*

## AIR PROTECTION

Considering the nature and volume of its operation, the Company is not a major polluter.

As a result of air protection measures implemented in earlier years, emissions have been below the limit values for several years just as in 2001, and TVK has caused no harm to air quality.




Flue gases exiting the stacks of the pyrolysis furnaces at the olefin plant account for most of the emissions.

The average volume of emitted flue gases is 600,000 $Nm^3/h$.

The total volume of sulphur dioxide, $NO_x$ and carbon monoxide emitted in flue gases is 110–120 kg/h. The concentration of all components can safely be kept below the limit values.

Natural gas as well as hydrogen and methane gases generated from the separation of gas at the olefin plant are used as fuels which are practically free of sulphur.

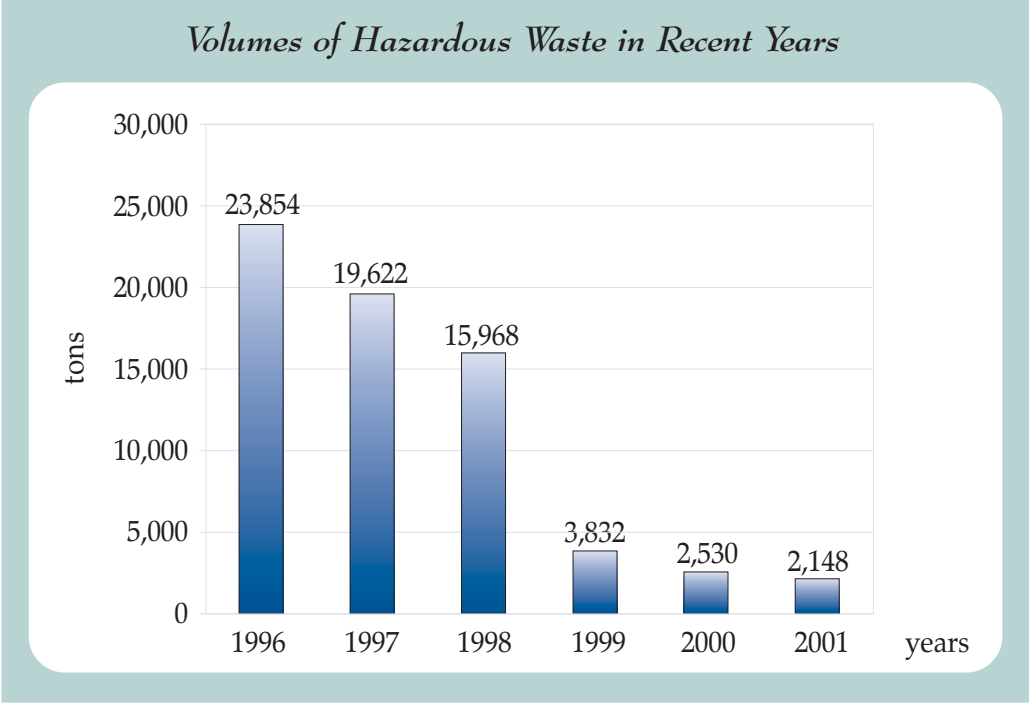
In addition, the carbon monoxide and $NO_x$ emissions can also be kept at the minimum values by using gas burners free of nitrogen oxide and an efficient burning control.

Even with the increased emission from the proposed olefin plant, the emission of all polluting components will be reduced substantially in the region as the power plant in Tiszapalkonya is to be closed down.

In 2001 we continued the replacement of halon fire extinguishers, modernised the system used for loading the $C_6$ fractions of the Olefin plant to railway containers and transformed 18 sample-taking points to form a closed system at the Olefin plant. Those measures helped to reduce the emission of diffuse pollutants.

**WASTE TREATMENT**

As a result of measures launched to minimise waste from production several years ago, the Company continued to reduce the amount of waste, especially hazardous waste in 2001.



The substantial reduction after 1998 essentially resulted from a new technique to remove water from the sludge during sewage treatment.

In 2001, the amount of non-hazardous waste was also reduced to a large extent due to the outsourcing and the subsequent divestiture of plastic processing plants.

Communal waste generated at the site is disposed on the landfill in Tiszaújváros.

No complaints were received from the authorities or the neighbouring towns in respect of the Company's waste management and waste disposal activities.

## NOISE AND VIBRATION PROTECTION

Thanks to the careful design of its location, the fences of the Company's site are at a distance of 1 km or more from residential areas in any direction. This protection zone ensures that the noise and vibration levels of the production technologies operated on the site cause no harmful effects.

We continuously monitor the noise and vibration load at the workplaces and take the necessary measures to eliminate any health hazard as part of our labour safety and occupational health care system.

## REHABILITATION OF CONTAMINATED AREAS

In the early 1990s we began to identify underground contamination generated on TVK's site in Tiszaújváros mainly in the previous 20-30 years. Having identified the level of contamination, the Company made a commitment to eliminate all underground contamination on the site at its own costs and to take all necessary actions to prevent any future re-contamination of the soil and underground water. Clean-up was started with the consent of the environmental authorities and under their mandate in 1995.

As a result of efforts in previous years, the decontamination of the areas of TiszaTextil Kft., Geo-Tipptex Kft. and Akzo Nobel Rt. that had been contaminated previously by TVK was completed in 2001. In the first two cases, the environmental authorities accepted the completion of clean-up. However, in the case of Akzo Nobel Rt., there is still a dispute between the parties as regards the origin of and responsibility for contamination identified at one point by the final control.

The ongoing clean-up of the area of TVK's fuel station is expected to be finished in the first half of 2002, and the decontamination of the railway loading/unloading site at the olefin plant will be completed in 2004.

In accordance with the provisions of the government decree No. 33 (March 17, 2000), the environmental authorities issued a new resolution in September 2001 requiring the Company to continue the removal of substantial hydrocarbon contamination generated by the small ethylene plant which had been built in the southern part of the site and had been equipped with Russian technology when the petrochemical industry was to be developed in 1969. Accordingly, we are examining various ecologically efficient methods of decontamination while continuously cleaning the underground water and soil on the site on the basis of the existing schedule.

Our objective is to accomplish the full environmental rehabilitation of the contaminated areas on the site by not later than 2010.

## *Environmental Expenditures*

The 2001 budget for environmental protection was HUF 926 million in the following breakdown:

| | |
|---|---|
| Environmental projects | HUF 304 million |
| Water treatment | HUF 218 million |
| Waste treatment | HUF 158 million |
| Decontamination | HUF 246 million |
| **Total:** | **HUF 926 million** |

## *Professional and Public Support for Environmental Protection*

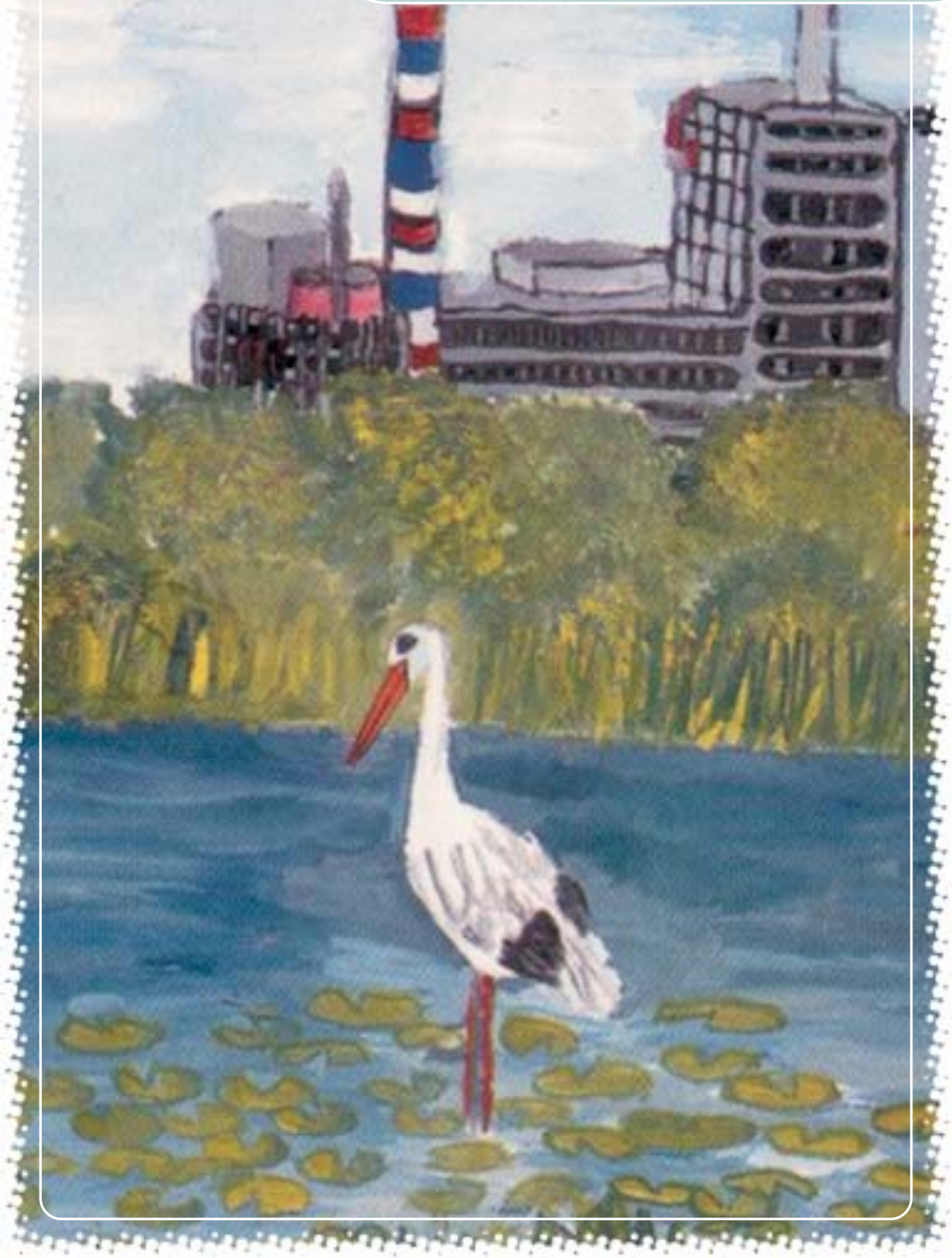
Apart from minimising the environmental impacts of our operations and improving the environmental awareness of our employees, TVK is also interested in enhancing the environmental performance of the industry and the Hungarian economy in order to comply with EU requirements and create the conditions for accession.

**For this purpose:**

- we regularly assist the government in the harmonisation of Hungary's environmental legislation with the EU acquis by providing expert opinion and proposals as a member of the Hungarian Chemical Industry Association and through other contacts. Our involvement was particularly active in 2001 when legislative harmonisation gained special impetus. We made several comments and proposals that were in turn taken into account in the codification of laws respecting environmental and industrial interests alike;
- as a member and sponsor of the "Industry for the Environment Foundation", we reward persons and organisations that have been active and have made outstanding achievements in environmental protection;
- we are a founding member of a representative group (including companies, institutions and government agencies) that awards the titles of "The Environmental Manager of the Year" and the "Prize for the Environmental Publication of the Year";
- we support university education, especially the environmental engineering faculty of the Miskolc University, offering thesis topics and practical training opportunities for students as an important part of professional education;
- we are involved in the work of the Hungarian Standards Institution and support the introduction of international environmental standards and the drafting of new national standards affecting environmental protection;
- in 2001 we offered a special award for the highly popular national competition "For Flowery Hungary" to recognise towns which excel in decorating their habitat;

- we published a 2001 calendar focusing on environmental topics. We used as illustrations the children's drawings which were submitted in a competition announced by TVK. Children were asked to make drawings on how they thought the environment could be protected and how it could be related to TVK.

*"TVK and Its Surroundings"*
*Work of Edit Papp,an Elementary School Pupil*



## *Communication with Interest Groups*

It is in our fundamental interest to communicate to all stakeholders how effective our environmental efforts are in the Hungarian chemical industry and how compatible they are with the environmental performance of the chemical industry in the EU. We aim to positively influence the image of the chemical industry and assert our interests by respecting the industrial and environmental aspects at the same time.

Consequently, our Company attaches great importance to developing and fostering relations and co-operating with all interest groups on the basis of economic realities and the principles of sustainable development as follows:

- Under the Environmental Management System, our employees are in practice fully involved in environmental functions. They endorse the Company's goals, enabling smooth co-operation and collective thinking in the accomplishment of the objectives formulated in our environmental policy.
- We use local media and co-operate with the municipal government of Tiszaújváros to inform the local public and seek their views on TVK's environmental activities and objectives. As an institutionalised form of public communication, we are required to hold public hearings and present all strategic projects subject to licenses for comments by the public. The municipal government and the major enterprises in the town - including TVK - expressed their intent to co-operate in the joint assessment of the environmental situation in the town and its surroundings, the selection of possible solutions to the problems and the successful implementation of the underlying tasks.
- We also aim to co-operate with non-governmental organisations representing environmental interests and have regular meetings where we discuss possible ways and frames of co-operation. In our opinion, non-governmental organisations serve as extremely important forums of interest representation among the institutions of democracy, hence we continue to attach great importance to fostering co-operation.
- As a highly valuable element of our business relations, we consistently and jointly perform the environmental rating of our partners on the basis of the requirements of the Environmental Management System.
- We have developed mutually correct relations with the authorities and other administrative bodies in environmental matters. In all official procedures we make utmost efforts to exploit all technical and legal possibilities, and it is also reciprocated by the other party.
- We regularly meet the representatives of the environmental profession and those interested in the protection of the environment at regional and national events and conferences. We communicate our environmental achievements, experience and views on current issues through personal contacts, in presentations and through the media.

## *Environmental Objectives*

The environmental chapter of the Company's business plan approved for 2002 and subsequent years describes measures that take into account the objectives formulated in the environmental policy, the need for solving environmental problems as well as the environmental requirements of the EU for Hungary's accession.

TVK's management regards the preparations for EU membership as a strategically important process as most of our products are exported to EU markets. We favourably view the conditions for maintaining our market positions and complying with environmental requirements.

TVK relies on modern technologies and an excellent team of experts. Our environmental conditions are adequate, and our environmental performance shows that we are already able to satisfy the environmental criteria of the EU for the most part.

Hungary's EU membership is expected to strengthen our economic and market positions, expand our relations and enhance our development opportunities.

Following are the most important concrete goals:

- To implement the tasks described in the water management concept, which was prepared in relation to the proposed strategic projects and was approved by the environmental and water management authorities for the increased protection of the Tisza River as the source of our industrial water and the recipient of cleaned rainwater and sewage. Such tasks include the modernisation of water and sewage treatment, and the construction of a new compensating reservoir integrated with the sewage treatment technology to replace the emergency reservoirs of the olefin plant and the previous paint factory.
- Key importance is attached to the environmental rehabilitation of the site, including the continued decontamination of affected areas preferably with ecologically efficient techniques.
- The proposed capacity expansion of the olefin plant as part of the strategic projects should make it possible to reduce the carbon black emission of the flares located on the site.
- As another important task, we plan to prepare a detailed environmental impact study on the proposed new Polyethylene-4 plant to be used as a basis to obtain the necessary environmental licences. In addition, we will perform the mandatory environmental reviews and prepare the necessary licensing documentation for the facilities subject to a uniform environmental licence.

# Safety

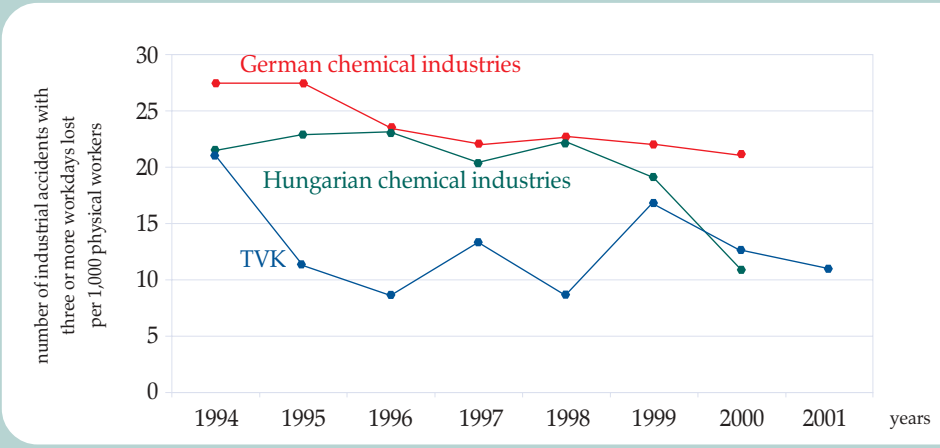
TVK pioneered in translating the system safety approach into practice, including the required organisation, methods and technical facilities, which is comparable with the practices of any EU member state. The new plants have been equipped with state-of-the-art technologies which also satisfy the requirements of maximum operational safety. It is of particular importance in our line of business where we operate highly inflammable and explosive petrochemical technologies.

The tasks related to safety are laid down in annual Safety Action Plans breaking down the most important functions to the individual operating units.

Our Company routinely performs preliminary hazard analyses and fault analyses that are complemented with a wide range of destructive and non-destructive tests using state-of-the-art instruments. This testing was accredited by the National Accreditation Board under the MSZ EN 45001:1990 standard in 2000.

TVK is the only company in Hungary that operates a safety valve testing and adjustment laboratory. It is operated in collaboration with the experts of the Miskolc University to regularly check pressure limiting instruments. A valve testing station is available to check the fittings of high-pressure technologies for leaks (up to 5,000 bar).

*Frequency of Industrial Accidents**



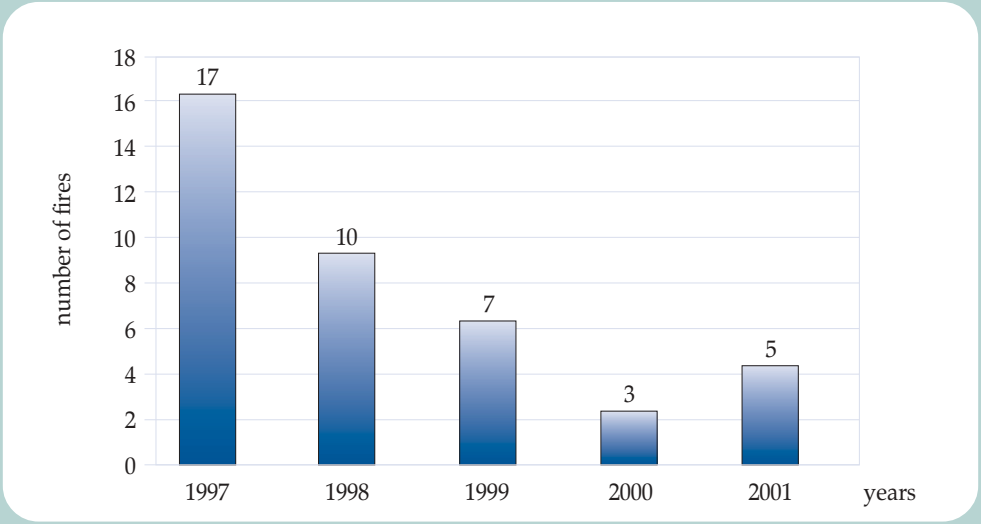

** The 2001 statistics on the Hungarian and German chemical industries were not available on the date of the present report.*

Our technical preventive measures are closely coupled with highly organised work safety and fire protection systems and the related training of our employees.

Work safety operations are based on the regulations specified in the Occupational Health and Safety Management System which was introduced in accordance with the OHSAS 18001:1999 standard by January 1, 2002. As a result, the number of industrial accidents has continuously decreased.

A downward trend is also noticeable in the number of fire accidents on the site thanks to fire safety training provided to our employees, the superior technical standards of fire protection systems and the on-site fire brigade equipped with the most up-to-date fire fighting techniques and maintained jointly with other large companies in the region.

*Number of Fires at TVK*




*5000 Bar Compressor of the High Pressure Measuring Station*

Unannounced emergency exercises are held periodically for the staff operating the technologies and the on-site fire brigade to eliminate emergency situations. The Technical Rescue Team co-operates with the on-site fire brigade in road accidents occurring in the transportation of hazardous materials under a Chemical Industry Alarm Information system.

Regular disaster prevention exercises are held to ensure the efficient operation of the fire fighting and technical rescue teams. TVK was one of the chief organisers of a large three-day international conference on disaster prevention under the auspices of the UN European Economic Committee in October 2001. One of the highlights of the conference was a disaster prevention exercise at the Olefin plant.

As a traditional feature, we also organised the Month of Occupational Safety in 2001 to brush up and expand the occupational safety, fire protection and technical supervision skills of our employees.

*Exercise of Protection against Catastrophe in the Olefin Plant*

*Setting Up and Calibration of a Safety Valve on Test Bench Number 2 in the Safety Valve Laboratory*

Our Company has to allocate substantial resources for ensuring and improving the conditions of safe operation.

*The Following Amounts Were Spent on Safety Projects*

| | |
|---|---|
| 1998 | HUF 183 million |
| 1999 | HUF 143 million |
| 2000 | HUF 389 million |
| 2001 | HUF 261 million |

**As a result of consistent safety operations in 2001:**

- no fatal or serious accidents occurred;
- there were 14 industrial accidents with three or more workdays lost (i.e. 6.11 accidents per 1,000 employees or 10.99 accidents per 1,000 physical workers);
- no fires causing personal injury occurred;
- there were one serious and four small fires.

As an important task for the immediate future, the operators of high-risk units will have to prepare a Safety Report.

# Health Protection

A wide range of high-level health care services are offered to protect the employees health. Our health policy is based on occupational health and work capacity tests and the requirements of emergency care.

Special importance is attached to the good health and welfare of our employees. To ensure this, we have signed contracts and have been co-operating with several health care providers (e.g. for dental, ophthalmology, gynaecology, urology services).

As part of health promotion, we support mass sports. We spent about HUF 2.5 million for that purpose, benefiting one third of our employees in 2001.

In 2000, we took a major step forward to improve the health condition of our employees when we joined the nationally recognised "Dimension" Voluntary Mutual Health Fund, offering our employees the possibility to sign up as members.

As a sign of the level and importance of the service provided, the number of employees who joined the Fund continued to rise in 2001.

The Fund members can use the funds in their individual accounts to finance dental, optical, fitness, recreational, homeopathic, sanatorium, private practitioner, home care and pharmaceutical services.

Employees who join the Fund participate in controlled health promotion and disease prevention programmes, and go to regular check-ups. Depending on the diagnosis, they can also receive special treatment.

Our future goal is to develop a full-scale health protection system that covers all specialisations and to upgrade the quality of the health service network.

# Appendix

## *Definitions of Terms Used in the Report.*

- **emergency exercise:** an exercise to eliminate a simulated accident that may occur in a given high-risk plant
- **Safety Action Plan (SAP):** an annual plan of safety-related actions, projects and organisational tasks covering the company as a whole
- **EEC:** European Economic Committee
- **personal protection device/clothing:** a device or clothing used or worn by employees to prevent or reduce the hazardous and/or harmful impacts of the technologies, and protecting only the person using or wearing it
- **flare:** safety equipment used in the petrochemical and oil industry used for the safe discharge and disposal of combustible gases blown down from closed technologies
- **reverse osmosis (RO):** a water treatment procedure whereby the water to be desalinated is led through a semi-permeable membrane filter under pressure which only allows the salt-free water to pass through, and the salt concentration will increase in remaining solution
- **HDPE (high density polyethylene):** high-density polyethylene, a polyethylene grade
- **volatile organic compounds (VOC):** organic compounds whose steam pressure exceeds a certain value at a specific temperature
- **Environmental Management System (EMS):** part of the overall management system of TVK that includes the organisational structure, planning, responsibilities, practices, procedures, processes and resources necessary for the development, introduction, implementation, review and maintenance of the environmental policy
- **LDPE (low density polyethylene):** low density polyethylene, a polyethylene grade
- **Occupational Health and Safety Management System:** part of the general management system that includes the management of occupational health and safety risks related to operation, the organisational structure, planning, responsibilities, practices, procedures, processes and resources, the implementation, review and maintenance of the occupational health and safety policy
- **PE:** polyethylene
- **PP:** polypropylene

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