



CSIR Annual Report 1999

Expanding
the frontiers of
knowledge, shaping
our future through the
power of science
and technology
to build a better
world for all



CSIR Annual Report 1999

CSIR Structure

CSIR Board

President

Executive

Business Development	Finance and Commercialisation	Human Resources	Technology for Development and Policy	Technology and Chief Information Officer
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Business Units

<i>Building and Construction Technology</i>	<i>Manufacturing and Materials Technology</i>
<i>Bio/Chemical Technologies</i>	<i>Mining Technology</i>
<i>Defence Technology</i>	<i>Roads and Transport Technology</i>
<i>Food Science and Technology</i>	<i>Textile Technology</i>
<i>Information and Communications Technology</i>	<i>Water, Environment and Forestry Technology</i>

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OUR VISION

To be the best in technology, leadership and partnering, and – through our people – fight poverty, build global competitiveness and make an enduring difference in people's lives.

OUR MISSION

The CSIR is a uniquely South African organisation, committed to innovation. We provide technology solutions and information to support sustainable development and economic growth in the context of national priorities.

OUR VALUES

CSIR people...

- have a passion for **E**xcellence
- live **S**ervice, striving to anticipate, meet and exceed the needs of our clients and stakeholders
- recognise that it's **P**eople who make things happen – and work towards others' growth and development
- strive always for **R**elevance – finding solutions to real needs, making a difference – national priorities are our priorities
- are committed to **I**nnovation – our lifeblood: from idea generation through to practical implementation
- . . . always with unshakeable in**T**egrity

ESPRIT - the
spirit of the
CSIR

In harnessing the power of science and technology, we have created viable opportunities in the formal and informal sectors to help South Africa take its place among the winning nations of the world

The relevance and impact of our diverse range of activities for the year under review are profiled in *Technology Impact*, the companion document to this Annual Report. The selection of our achievements that we highlight here and those portrayed in *Technology Impact* show how the CSIR has supported the key pillars of the Government's Science and Technology policy, and demonstrate our progress in delivering technology and innovation to make a real difference.



Satellite support, helping the gold mining industry and growth in foreign income

- The commissioning of a Ku/Ka band satellite support facility at the CSIR Satellite Application Centre at Hartebeesthoek has resulted in a major contract with the US-based Hughes Space and Communications company to provide transfer orbit services for all its future missions over Europe, Africa and Middle East. The system has also been used to support a Japanese satellite with good quality ranging data at almost 100 000 km, more than twice the distance of the normal geo-synchronous orbit.



- As a major participant in the Deepmine collaborative research programme, the CSIR is helping the gold mining industry to find solutions to mine successfully at depths between 3 km and 5 km. The programme is supported by the three major gold mining companies, the Department of Trade and Industry, the Chamber of Mines, CSIR, Wits University, NRF/THRIP as well as the Departments of Minerals and Energy, and Labour.
- The CSIR again achieved major growth in external contract income internationally. This now





exceeds R40 million per annum. Five-year compound growth in international income has been in excess of 30% per annum.

Traffic safety, support for entrepreneurs and novel access roads in remote areas

- The CSIR has supported the Arrive Alive traffic safety campaign, with its focus on reducing speed and alcohol-related accidents, through survey facilitation, data evaluation and process monitoring.
- Two Entrepreneurial Support Centres have been established in the North West Province. This led to a request from its Department of Finance and Economic Affairs for the CSIR to facilitate, screen and implement technology projects to address the province's rural economic development needs.
- The CSIR's innovative new approaches to providing access roads with thin layer concrete sections have been demonstrated at Lubisi in the Eastern Cape.

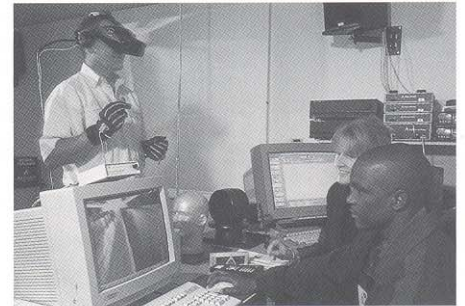
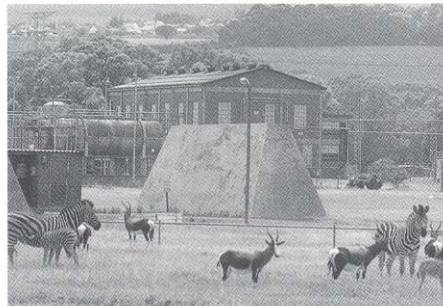
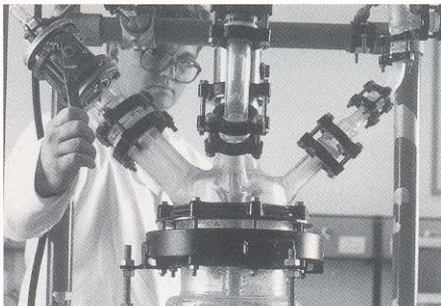
Capacity growth in bio/chemical technologies, environmental assessments and international mining consultancy

- Following an agreement with AECI Ltd to acquire their R&D Department, the CSIR now operates a R50 million turnover research,

- The CSIR continued to undertake important complex Strategic Environmental Assessments (SEA) and Environmental Impact Assessments (EIA). These included the Durban South Industrial Basin (in partnership with Durban Corporation and Somchem) to identify development approaches and constraints for Krantzkop. Increasingly, the CSIR is undertaking environmental assessments and studies for international aid agencies and multinational corporations in SADC.
- The CSIR and Snowden Associates in Australia have formed Snowden Mining Industry Consultants. This joint venture company will provide high-level, integrated consultancy services to the mining industry internationally. Offices are located in Perth, Kalgoorlie, Sydney, Vancouver and Johannesburg.

Electronic warfare simulation, virtual reality solutions and high value plant extracts

- The CSIR completed an Electronic Warfare Simulator – the most advanced and significant electronic warfare work undertaken in South Africa for more than a decade – to help the South African National Defence Force optimise the application of its funds by simulating purchase and operations options.



development and engineering unit in Pinelands, Modderfontein. Key projects include biotechnology and fermentation studies, and a suite of new products for the speciality and fine chemicals industry.

- A Virtual Reality Solutions Centre has been established at the CSIR. The Centre has successfully implemented projects in cultureware and communications, and developed mining and security applications.

Highlights and Achievements

(continued)

- The CSIR has established a joint venture with a UK-based company, Biosys Ltd, to develop a South African essential oils and botanical extracts industry from high-value plant extracts used in the perfume, cosmetics, health and food markets.

Food processing in Africa, recycling plastics and auditing SADC Y2K readiness

- USAID awarded the CSIR a five-year, R6,6 million contract to strengthen food processing in Africa. This will be done by developing networks that facilitate the transfer of technology to entrepreneurs as well as between countries. The project focuses on West and Southern Africa including Ghana, Senegal, Guinea, Namibia, Mocambique and South Africa.
- The Centre for Polymer Technology, established jointly by the CSIR and the Pretoria Technikon, has secured a number of major projects, such as establishing technology to recycle soft drink bottles for use in the production of second-generation products such as fibres, fibre-fill, carpets, strapping and automotive parts. A number of students have graduated from the Centre, all of whom have found employment in industry.

A novel anti-obesity agent, technology enhancement and breathable rainwear

- The CSIR and Phytopharm, a UK-based phyto-medicine company, are jointly developing a novel anti-obesity agent (P57) that has been extracted from an indigenous plant. Pfizer in the USA has taken a licence for the final clinical development.
- The departments of Foreign Affairs and Arts, Culture, Science and Technology have tasked the CSIR to act as the focal point for technology enhancement in the Indian Ocean Rim Association for Regional Co-operation.
- The CSIR has successfully upgraded its high performance technical fabric (breathable rainwear) technology and completed commercial pilot tests.

Providing satellite imagery, identifying groundwater resources and defending our air space

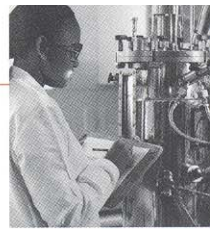
- The CSIR Satellite Applications Centre secured the largest single order in its history for 366 images from Earth Satellite Corporation of Rockville, USA, which has been contracted by NASA to



- A CSIR Y2K project team undertook an audit of the Y2K preparedness in the SADC region, including Angola, Malawi, Mauritius, Mozambique, Tanzania and Zimbabwe. The process identified the scope of the problem, the mission-critical systems per member state and the levels of readiness, assessed the potential impact of the problem on the country/region and proposed guidelines for action. A report with recommendations was provided to each country.

produce a global land cover map using LANDSAT™ data.

- Decision support and modelling systems have been successfully applied in a number of areas. This includes, in conjunction with Parsons Consultants, a new map that identifies South Africa's groundwater resources. We have also developed a groundwater quality management strategy which assesses the impact of effluent on the marine environment.



- The CSIR has been approached to provide acquisition decision support to the Ground Based Air Defence project team – a top priority project of the South African Army – to ensure that equipment used for detecting and responding to air threats is effective.

New commercial ventures, innovative water treatments and helping the reform process in the construction industry

Technovent

A MEMBER OF THE CSIR GROUP

- Technovent (Pty) Ltd was established as a CSIR-owned technology ventures company to acquire and incubate proven technologies into commercially viable enterprises. Technologies are sourced from the CSIR, universities, other science and technology institutions and technology developers. Three companies have so far been set up as part of Technovent: Plasmatherm, ThermaSpray and AMP Ceramics.



- The CSIR has developed and implemented innovative water treatment technologies to remove sulphate from mine water waste streams and to stabilise aggressively corrosive acid water for municipalities.
- The CSIR played a major role in the development of the White Paper on Creating an Enabling Environment in the Construction Industry and produced a best practices guideline to enhance employment opportunities in the industry.

The following represents a small selection of some of the more than 7 000 contracts undertaken by the CSIR during the year under review:

- Investigated facilities, policy changes and the impact of Information Technology (IT) in the delivery of education.
- Documented, analysed and strengthened existing SADC standardisation, quality assurance and metrology capabilities.
- Investigated the mechanisation of mining operations and their economic potential.
- Implemented Travel Demand Management, a demonstration project to reduce the use of private vehicles and enhance the use of public transport in the Midrand area.
- Investigated the effectiveness of informal crime prevention groups at modal interchanges.
- Tested small-scale medical waste incinerators earmarked for rural clinics in Kazakhstan and South Africa.
- Undertook a pilot project to look at the fundamental restructuring of the planning and operations of public transport in Durban.
- Led Offshore Petroleum and Coastal Zone investigations as a participant in the United Nations Development Programme for the Benguela Current Large Marine Ecosystem study.
- Conducted a detailed techno-economic study of the recycling of textile waste in Mauritius.
- Developed and established a hardware-in-the-loop simulator facility to test and evaluate the electronic counter measures of operational radars and radar guided missiles.
- Developed a strategic capital investment plan and individual project plans for the Eastern Cape hospital rehabilitation and reconstruction programme.
- Investigated the use of a seismic system to predict the collapse of a mined-out seam behind a long wall-face in Australia.
- Supported the South African Air Force in flutter analyses, flutter flight tests, store release analyses and aeroelastic technology development for weapons integration on aircraft.
- Provided environmental consultancy on the East London marine pipe line.
- Established an alcohol/drug-related database and monitoring system for the alcohol/drug crime nexus.
- Developed an active coal dust explosion suppression system for coal mines in Australia.



Highlights and Achievements

(continued)

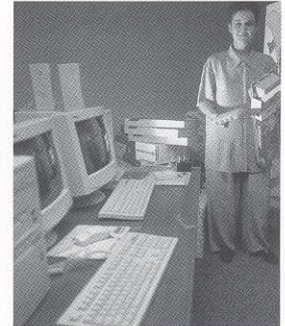


Good corporate governance

The CSIR was one of the six finalists in the 1998 Corporate Governance Award. The Award is jointly sponsored by Deloitte & Touche and the Johannesburg Stock Exchange. This achievement bears testimony to the way in which we conduct our business, and to the dedication and commitment of our staff.

Helping communities to access information

The Manguzi telecentre project, where the CSIR has installed an Information and Communications Technology (ICT) infrastructure and an inTouch Africa™ software system to enable the Manguzi community to access information and create, maintain, present and distribute their own, has been designated as a focal point in the development of the information technology spine of the Lebombo Corridor.



Recognition for quality and excellence

- CSIR Defence Technology completed an assessment for the National Quality Awards, and was adjudged the winner of the Defence category.
- Two of our internal service groups and one of our business units have been registered in accordance with the SABS ISO 14001 for Environmental Management Systems. One of our business units achieved full ISO 9001 accreditation.
- In recognition of the continued quality of its training programmes, the CSIR's Apprentice Training Centre in Pretoria was awarded full accreditation by the Printing, Newspaper and Packaging Industries Education and Training Board.

Highlighting some awards and achievements

- Brigid Boltman won the 1998 JD Roberts award for driving the establishment of the new R350 million medical teaching hospital in Umtata.
- The Satellite Application Centre received a special award for business commitment and customer orientation at the SPOT IMAGE International Sales Network Seminar in France.
- Dr Arno Daehnke received the Roche Medal from the International Society of Rock Mechanics for the best international PhD thesis in rock mechanics.
- Dr Rob Hurlin is President of the South African Aerospace Engineering Institute.
- Dr Adi Paterson was appointed to the National Advisory Council on Innovation by the Minister of Arts, Culture, Science and Technology.
- Dr Namane Magau serves on the Commission for Higher Education as appointed by the Minister of Education.



The CSIR's Apprentice Training Centre was established to broaden the base of technical skills available to the emerging manufacturing SMME sector.



- Dr Rodney Milford is president of the South African Institute of Civil Engineers.
- Dr Reinie Biesenbach is a Commissioner of the South African National Commission for UNESCO.
- Dr Phillip de Vos is the first person from southern Africa to be appointed to the Society of Fire Protection Engineers in the US.



- Dr Geoff Garrett, CSIR President, won the 1998 SA Boss of the Year Award which recognises exceptional leadership in the workplace. Dr Garrett was nominated for the award by his personal assistant, Louise van der Merwe.



- The CSIR participated in the 1998 Year of Science and Technology with, *inter alia*, a S&T festival, a laser show, a community day and its 1998 Mindwalk Competition. It also acted as lead council for the DACST IT thrust and participated in the DACST road show.



- Tshidi Masemola proudly displays, on behalf of her business unit, the Achiever Award for Technology for Women in Business awarded to CSIR Food Science and Technology by the Department of Trade and Industry.

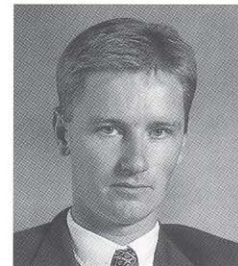
CSIR 1998 Outstanding Achievers

Depth of talent, innovation and enthusiasm characterise the people of the CSIR. Our outstanding achievers are commended for their commitment to delivering high-quality, value-added products and services to our clients and stakeholders.

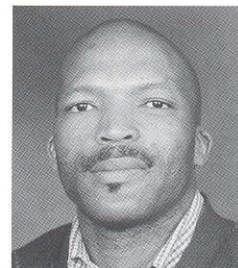
- Dr Patricia Truter successfully led the refocusing of the Centre for Polymer Technology and orchestrated a growing number of patents and international contracts.



- Dr Bruce Foulis was instrumental in developing a formal partnership with the Department of Trade and Industry regarding national measurement standards. In doing so he positively enhanced the visibility and credibility of the CSIR.



- Solly Bosoga got local communities and schools actively involved in CSIR sporting and educational activities. As chairman of the CSIR Club, he has been instrumental in building bridges between diverse groups of people in the CSIR's ongoing transformation process.



- Suzette Harmse played a major role in ensuring the CSIR's financial sustainability. Her sound understanding of technology and systems has added great value to the CSIR's commercial interactions and her leadership in the CSIR's Pension Fund and Medical Aid Scheme has resulted in considerable Fund growth and improved Scheme efficiency.

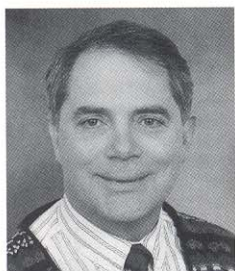


Innovation,
underpinned by world class
technology,
will help to create a future
for our nation in the
competitive
world
of today
and tomorrow



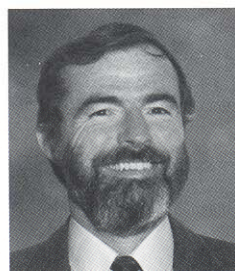
- Katryn Oosthuizen, Rebeca Mabilo, Sam Evans and Petrus Mahlangu (absent), our frontline visitor's reception team which successfully looked after more than 192 000 local and international visitors during the year under review.

CSIR 1998 Outstanding Achievers (continued)



Defence Force and, in the process, enhanced the scope and credibility of the CSIR.

- Francois Anderson is a key figure in defence technology policy and strategic planning in South Africa. He has been instrumental in establishing and reinforcing relationships with the South African National



- Patrick Morant is a pioneer of Integrated Environmental Management and lead author of, or contributor to, almost 40 major environmental assessment and management reviews.



- Dr Marthinus Horak, Jeremiah Senabe and Dr Vinesh Maharaj who screened indigenous plants to find biologically active constituents. They identified an appetite suppressant, currently known as P57, that promises to become the first prescription drug derived from an African plant.



- Johan le Roux, Gardi Oosthuizen, Yoshie Ragland, Duma Magxwalisa, Edith Ningi, Sarah Yalolo, Xoliswa Siko, Hannelie Herselman, Josef Greeff and Florence Mayedwa (absent Richard Ragland and Janine Schroeder) whose expertise in textile technology and SMME development has helped train, develop and nurture skills that will create jobs, self-sustaining communities and SMMEs.



- The Airhead team has been lauded by the process industry for their development of the Airhead, a compact, low-cost measurement device. From left to right: Dr Namane Magau, CSIR Executive Vice-President: Human Resources, James Tenant, Jenny Brits, Brenda Bradley, Peter Bosscha, Rob Sinclair, André Nepgen, Chris Botha, Solly Bosoga, Hans Bothma, Dries Holtzhausen and Nic Nicolaides. Team members not in the photo: Richard Wheatley, Thegaran Naidoo, Dawid van der Merwe and Louise Nortman.



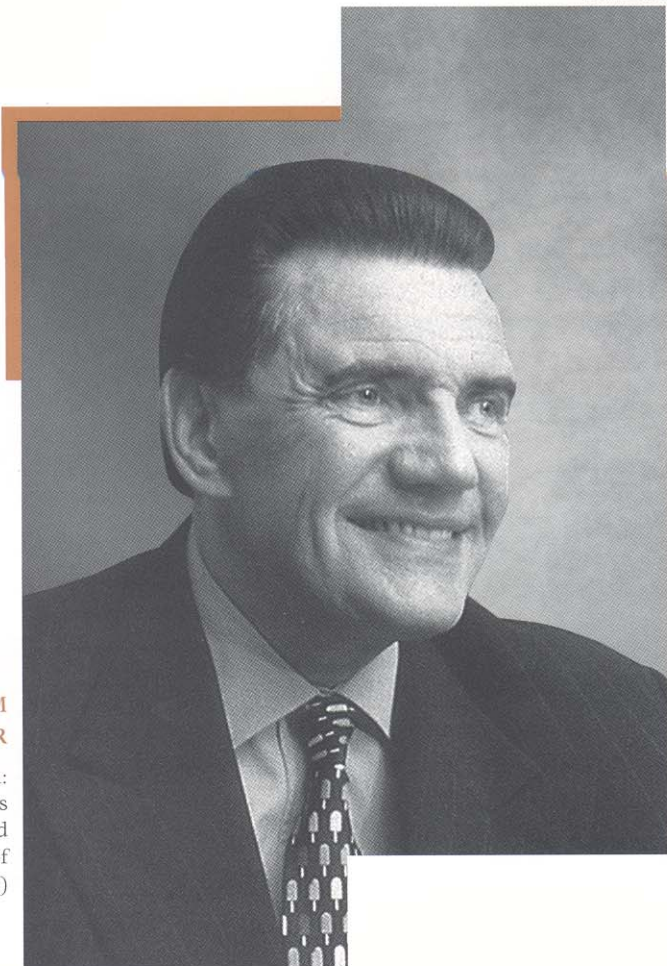
- Dr John Napier, Dr Francois Malan, Dr Ewan Sellers, Dr Arno Daehnke and Mark Hildyard whose understanding and anticipation of the behaviour of rock mass surrounding mining excavations helps to ensure that mining continues to be a pillar of the South African economy.

In the
information
age, knowledge rather
than assets or resources, is
the key to
excellence
and
competitiveness

The Chairman's Review is usually a medium for reflecting the achievements, challenges, triumphs and the bottom line of a single year. In an age of ever-increasing expectations and pressures and accelerating new applications of advanced technologies, it is also a platform for prospecting as much as for retrospecting.

The landscape of tomorrow

We are standing not so much at the summit of the second millennium, but more especially in the foothills leading to the third. What do we see in this landscape? It has historical peaks and valleys reflecting economic growth and socio-political well-being, inadequate GDP spend, national and global stability, low GDP growth, and peace and prosperity. The landscape of tomorrow is unfamiliar: it is a world where the notion of boundaries no longer applies. The worldwide communications and information



**DR WILLIAM
(BILL) VENTER**

Executive Chairman:
Allied Electronics
Corporation Limited
(Altron Group of
Companies)

CSIR Board Members



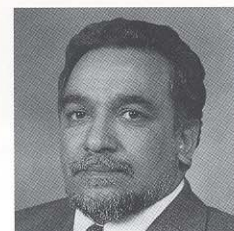
MR LES BOYD

Deputy Chairman:
Anglo American
Corporation of SA Ltd



**PROF ANTON
EBERHARD**

Head: Energy for
Development Research
Centre
University of Cape Town



DR DHIRO GIHWALA

Director: School of Science,
Peninsula Technikon



technology network brings the fields of science and technology forward as the "knowledge" economy. Are we, at the CSIR, prepared to embrace this new world paradigm and impart real benefits to the South African economy and its people?

I do believe that the CSIR has the necessary substance and motivation to ensure this success: its reputation for technological excellence and innovation spans more than half a century and recent international reviews confirmed its standing as a world-class enterprise. This is illustrated by the depth of talent, the innovative capability and the enthusiasm of our people. I am truly heartened by these valuable qualities of the CSIR people: they have the theoretical knowledge and the practical application to provide solutions that work outside the laboratory. They work under great pressure imposed by time and budget constraints and are successfully able to realise the most challenging projects. This augurs well for our new millennium.

If we harness the power and the potential of science and technology, we shall shape our future

and make a positive and meaningful difference to the quality of life of our nation and to that of Mother Africa. This vision necessitates a search for opportunities and a sharing of knowledge and experience, that we may enter into dynamic, mutually beneficial partnerships with like-minded world players. In the current environment of stiff competition and commercial realities, the CSIR will succeed only if it strives to be an organisation of business-minded entrepreneurs.

In the information age, knowledge, rather than physical assets or resources, is the key to excellence and competitiveness. For the knowledge-intensive organisation, feeding knowledge through from research and development to innovative products and processes is the critical element. What is important for the CSIR is the recognition of the need to harness, manage and use knowledge like any other asset. We, at the CSIR, understand the necessity to gain control of our intellectual capital and, in so doing, let staff in all areas of our activities have access to it.

CSIR Board Members *(continued)*



MS ANNE LETSEBE

Chief Director:
Social Sector Coordination
and Implementation Unit
Office of the Presidency



PROF FRIEDEL SELLSCHOP

Schonland Professorial Research
Fellow and Professor Emeritus:
Schonland Research Centre for
Nuclear Sciences and Department
of Physics, University of the
Witwatersrand



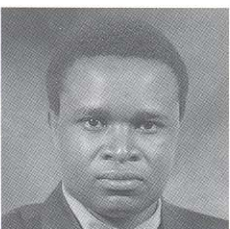
MR KHAYA NGQULA

Chief Executive Officer:
Industrial Development
Corporation of SA Ltd



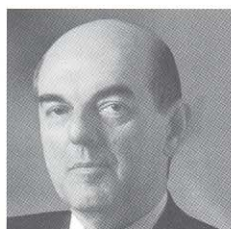
MS LYNDALL SHOPE-MAFOLE

Advisor to the Minister of
Communications



MR KHOMOTSO PHIHLELA

Managing Director:
Tolcon (Pty) Ltd



MR EUGÈNE VAN AS

Executive Chairman:
Sappi Ltd

Chairman's Review

(continued)

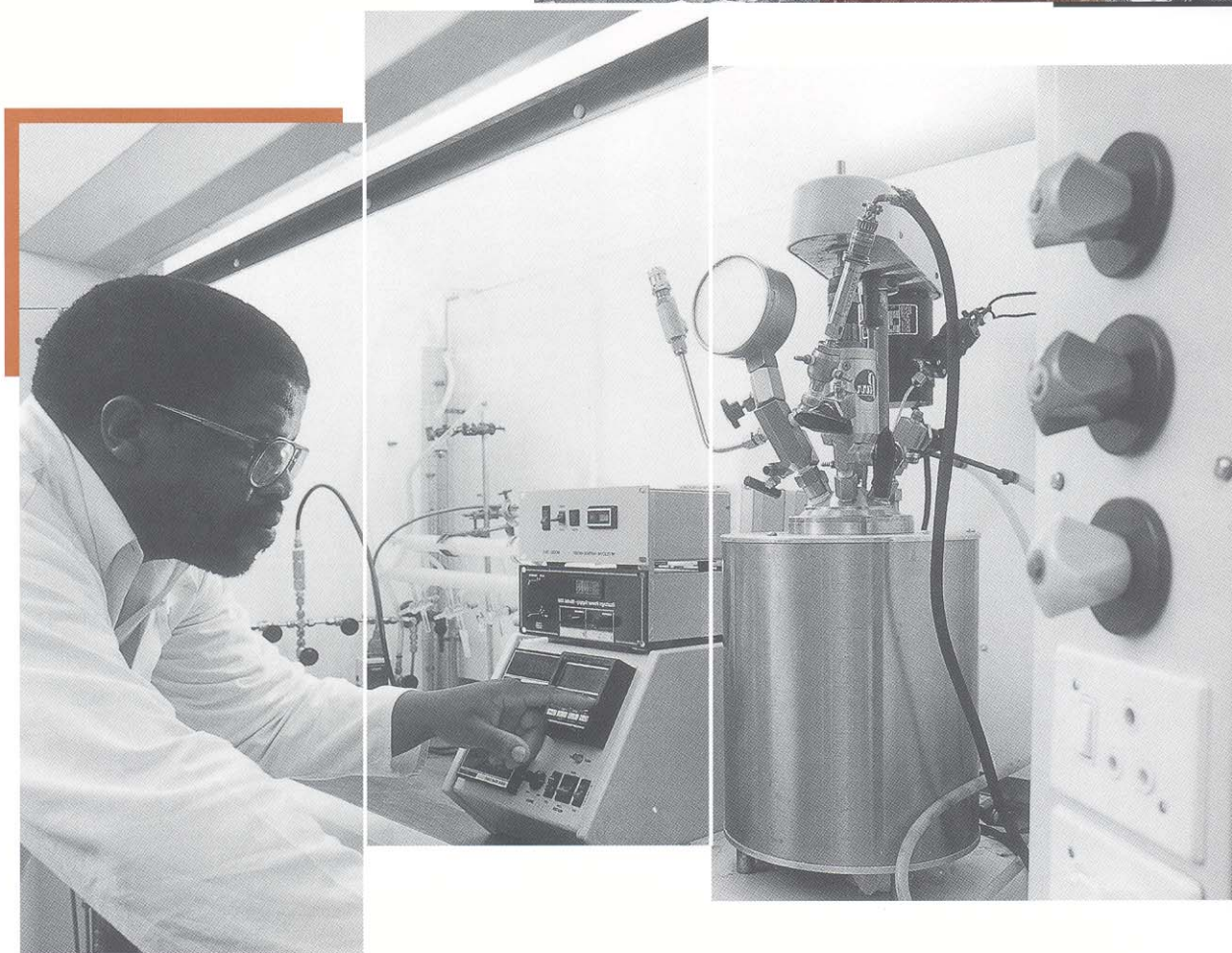
We have become accustomed to appreciate that knowledge is critical to value and performance, and underpins everything we do. The challenge will be to harness something you cannot see. Knowledge is a constant flow; it is about what is in peoples' heads rather than what is in a database. Knowledge management has been embraced by the CSIR even though it is not an easy task by any means – but it is one that no leading 21st-century enterprise can afford to ignore.

The Cabinet, in the 1998 Science Councils' Review, endorsed key CSIR recommendations, demonstrating its commitment to a clear strategy of cultivating a market-oriented culture; developing new mechanisms for the transfer of technologies into the marketplace; and building and leveraging powerful alliances at home and abroad. Clearly, the CSIR is totally dedicated to fulfilling these ideals.

Links to the global economy

The needs and expectations of South Africa's citizens can be met only if there is an economic revival in South Africa and further afield. Such a revival can take place only in concert with the global economy and global trends. Accordingly, the South African revival must be driven by science and technology and more especially by the use of the Internet and knowledge management systems and solutions.

Furthermore, all knowledge intensive organisations, like the CSIR, will in future be ranked by their ability to participate effectively in local and global partnerships that require a high degree of collaboration. It is indeed pleasing to record that the CSIR has made major strides in partnering with clients, customers and other knowledge workers, locally and internationally, to bring to reality the commercial implementation of technology in Africa.



Using a laboratory scale reactor to evaluate novel chemical processes and undertake scale-up studies.



Measuring up to the national imperatives

Key objectives are the building of appropriate competencies to provide South Africa with the required technologically based solutions to national requirements and, on a broader front, promoting and developing a culture of science and technology to support long-term sustainable development and economic growth.

The National System of Innovation in the White Paper on Science and Technology provided a useful basis for assessing the effectiveness of the CSIR's broad application of resources and the benefits to clients. These are illustrated in *Technology Impact*, the companion document to this annual report.

Creating competitiveness and employment

Significant technological innovation is required for South Africa to achieve international competitiveness. These advances must, of course, go hand-in-hand with the creation of new jobs for those previously excluded from participating fully in the national economy. The CSIR's role as technology partner for industry is steadily contributing to reaching this goal.



Enhancing quality of life and skills

Considerable energy and resources have been devoted to small business creation and entrepreneurial support. Two pilot manufacturing advisory centres, both CSIR partnership projects, in KwaZulu/Natal and the Eastern Cape are already providing advisory support to a significant number of small businesses.

The Indigenous Technologies Audit – originally driven by the CSIR in co-operation with the Parliamentary Portfolio Committee on Arts, Culture, Science and Technology – has grown into the National Indigenous Knowledge Systems Audit, and will play an important role in guiding and developing the concept of an African Renaissance, as articulated by South Africa's new President, Mr Thabo Mbeki. His vision includes a deeper, life-long culture of training and learning throughout the nation, to enable each citizen to adapt to the changing circumstances of the modern world.

At the CSIR, we have taken up the challenge of identifying, training and empowering our young technologically oriented persons. The launch of the CSIR Innovation Leadership and Learning Academy (CILLA) is an important milestone in this regard.

Enhancing the environment

Future generations will judge the present generation harshly if economic growth in South Africa is pursued at the expense of environmental sustainability. Accordingly, all technological endeavours must be subjected to scrutiny, and innovative methods must be used to ensure environmental progress as well as economic successes. In this regard, the CSIR's extensive knowledge base and resources in the biophysical environment of Africa continues to expand, with major experience gained in integrating all aspects of environmental research, control and advancement.

Promoting the information society

The CSIR works toward an equitable, effective information society. It seeks, in as many ways as possible, to narrow the gaps between the haves and the have-nots, the knows and the know-nots. The potential of information and communications technology (IT) to, for example, uplift education and social development is being actively developed at the CSIR.

In appreciation

It has, once again, been an honour and a privilege for me to chair the CSIR Board during this past year. I thank my fellow Board members most sincerely for their support and co-operation, and the significant contributions they have made during the year to the progress of the CSIR. I thank too, our valued clients, alliance partners and suppliers. The results for the past year reflect both the strength and resilience of the operations of the CSIR. These have been developed over many years on firm, ethical foundations and sound business principles. The success of the CSIR and its future lies in the hands of its loyal employees who have so diligently contributed their expertise and talents. Their sterling efforts are highly valued.

The Board congratulates the management on their achievements and we thank them for their fine contribution.

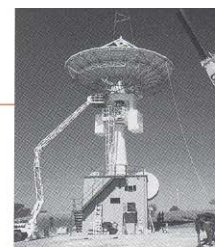


Dr W P Venter

Chairman

Annual Financial Statements

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Report by the Auditor-General

on the Group Financial Statements of the CSIR for the year ended 31 March 1999

1. Audit assignment

The group annual financial statements as set out on pages 14 to 51, for the year ended 31 March 1999, have been audited in terms of the provisions of section 188 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), read with sections 3 and 5 of the Auditor-General Act, 1995 (Act No. 12 of 1995), and section 14 (1) of the Scientific Research Council Act, 1988 (Act No. 46 of 1988). These financial statements, the maintenance of effective control measures and compliance with relevant laws and regulations are the responsibility of the President of the CSIR. My responsibility is to express an opinion on these financial statements and the compliance with relevant laws and regulations applicable to financial matters, based on the audit.

2. Regularity audit

2.1 Nature and scope

2.1.1 Financial audit

The audit was conducted in accordance with generally accepted government auditing standards which incorporate generally accepted auditing standards. These standards require the audit to be planned and performed so as to obtain reasonable assurance that the financial statements are free from material misstatement. The audit was also planned and performed to obtain reasonable assurance that, in all material respects, the relevant requirements of the Reporting by Public Entities Act, 1992 (Act No. 93 of 1992) as amended, have been complied with. An audit includes:

- examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements;
- assessing the accounting principles used and significant estimates made by management; and
- evaluating the overall financial statement presentation.

I believe that my audit provides a reasonable basis for my opinion.

2.1.2 Compliance audit

Furthermore, an audit includes an examination, on a test basis, of evidence supporting compliance in all material respects with the relevant laws and regulations. I believe that the audit provides a reasonable basis for my opinion.

2.2 Audit opinion

2.2.1 Financial audit

In my opinion, the group financial statements fairly present, in all material respects, the financial position of the CSIR and the group at 31 March 1999 and the results of their operations and cash flows for the year then ended in accordance with generally accepted accounting practice and in the manner required by

Schedule 4 of the Companies Act, 1973 (Act No. 61 of 1973), and other reporting requirements as set out in the Reporting by Public Entities Act, 1992, as amended, and the regulations thereto. Furthermore, in my opinion, the information furnished in terms of sections 6 and 7 of the latter Act is fair in all significant respects and, where applicable, on a basis consistent with that of the preceding year.

2.2.2 Compliance audit

In my opinion:

- the transactions of the CSIR that were examined during the course of the audit were made in accordance with the applicable laws and instructions; and
- the transactions that were examined during the course of the audit were in all material aspects in accordance with the mandatory functions of the CSIR as determined by law or otherwise.

3. Emphasis of matter

Without qualifying the audit opinion above, attention is drawn to the following matters that came to light during the audit:

3.1 Certain subsidiaries excluded from the annual financial statements

Quality Electronics Development (Pty) Ltd was not consolidated, because the Board of the CSIR was of the opinion that it would be of no real value to the users of the financial statements in view of the insignificant amounts involved. I concur with this decision.

3.2 Year 2000 compliance of computer systems

The tasks identified by the CSIR for ensuring that the entity's systems are Year 2000 compliant have been completed, except for additional testing or interfaces where problems were experienced. This testing has been scheduled for June 1999.

Contingency planning has been addressed and it was found that most processes could revert to manual alternatives. Year 2000 testing has also been carried out at the CSIR's recovery site.

However, I do not provide any assurance regarding the Year 2000 compliance of computer systems in operation at the CSIR.

4. Appreciation

The assistance rendered by the CSIR during the audit is sincerely appreciated.



H van Zyl
for Auditor-General

Pretoria
9 June 1999

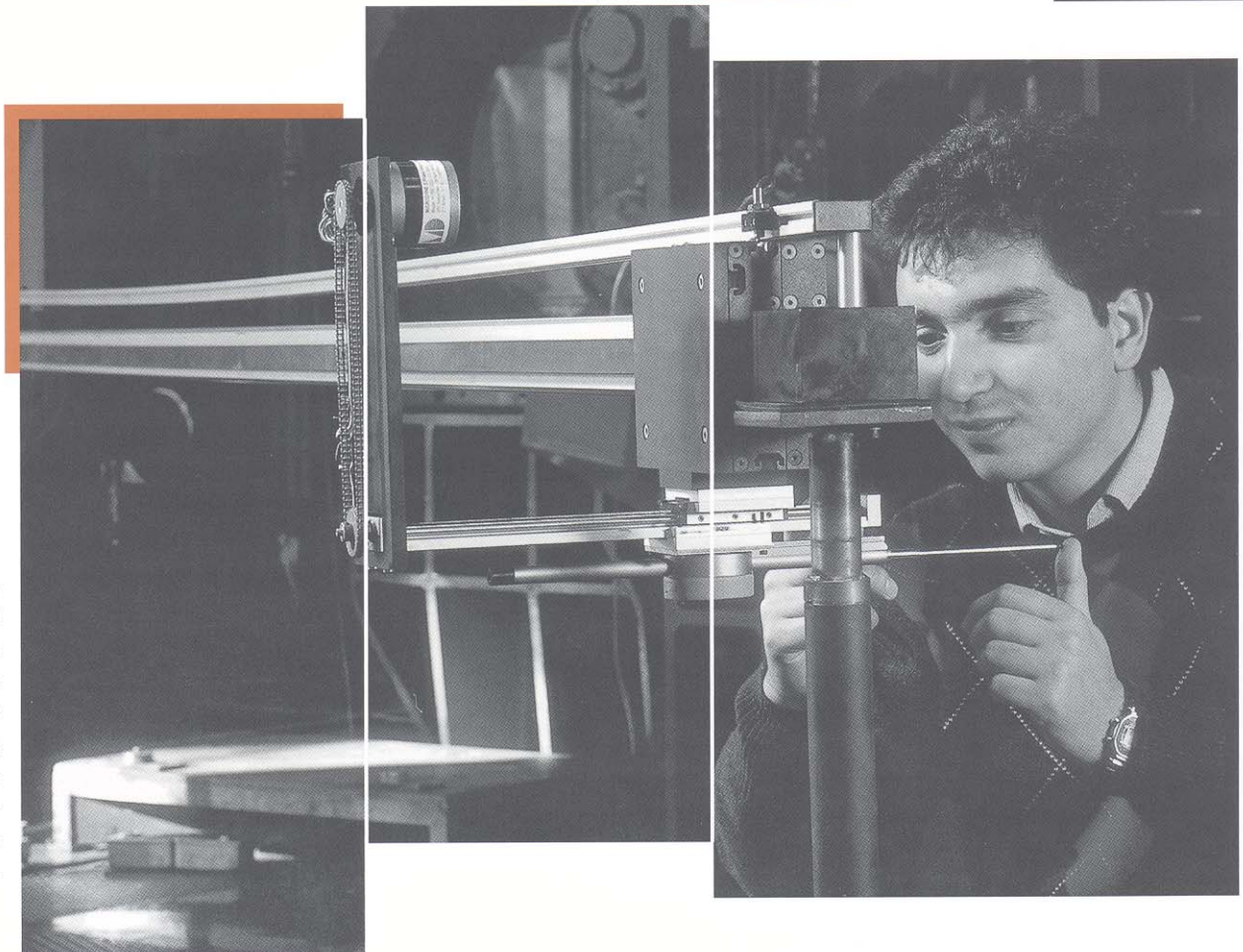
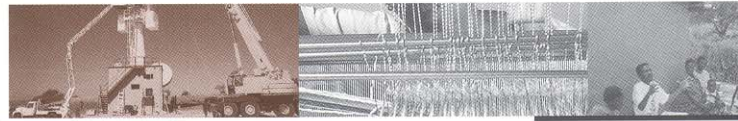
We acknowledge the crucial role of our people in helping to build an organisation based on our values of excellence, service, people, relevance, innovation and integrity

GOVERNANCE PRINCIPLES

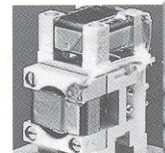
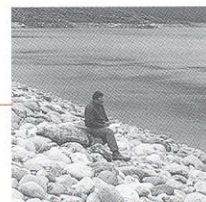
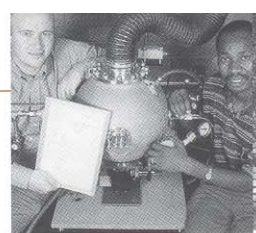
Framework

The CSIR fully subscribes to the principles of integrity, accountability and transparency and complies with generally accepted business practices by which corporate entities seek to govern themselves. It is committed to an open governance process, through which its clients and stakeholders may derive assurance that the organisation is being managed ethically, according to sound and effective risk management parameters in compliance with the best international practices.

The underpinning principles of the CSIR's corporate governance practices rest upon the three cornerstones of an effective and efficient organisation, namely day-to-day management processes, a long-term strategic planning process and effective transformation processes. All these processes are supported by CSIR systems which are used to plan, execute, deliver and control in the strategic



The service offered by the High Speed Wind Tunnel at the CSIR has been enhanced with the installation of a new Nozzle Contour Measuring System that provides a more accurate and quicker process of attaining supersonic speeds.



and operational domains of the organisation. The supporting infrastructure and its evolution is documented in a CSIR information architecture plan which is regularly reviewed.

The CSIR Board and its Management Board believe that the organisation has applied and complied with the principles incorporated in the Code of Corporate Practices and Conduct as set out in the King Report.

Policies, objectives and performance measurement

The CSIR Board monitors compliance with policies and achievement against objectives by holding management accountable for its activity through the measurement and control of operations by mandated report-back to the Board on a quarterly basis, including performance, reporting and forecasting against plan.

Financial statements

The CSIR Board and Executive Board are responsible for the preparation and integrity of the annual financial statements and related financial information included in this Annual Report. The financial statements are prepared in accordance with generally accepted accounting practice. The external auditors are responsible for independently auditing and reporting on the financial statements in conformity with generally accepted government auditing standards.

Schedule 4 / Public Entities Act

This annual report and its annual financial statements deal with all matters required by Schedule 4 of the Companies Act, Act 61 of 1973 and the Reporting by Public Entities Act, Act 93 of 1992, in all material respects.

Financial policies

The CSIR prepares its annual financial statements on the historical cost basis in accordance with generally accepted accounting practice, and the principal accounting policies are set out in the annual financial statements.

Risk management

In the case of risk management, the CSIR Board retains control through the final review of key risk matters affecting the organisation. The focus of risk management in the CSIR is on identifying, assessing, managing and monitoring all known forms of risk across all business units. CSIR systems have been put in place to review aspects of economy, efficiency and effectiveness. Management is involved in a

continuous process of improving procedures to ensure effective mechanisms for identifying and monitoring risks, such as skills, technology, reputation, Parliamentary Grant, legislation, professional liability and general operating risks.

Operating risk management

The CSIR endeavours to minimise operating risk by ensuring that the appropriate infrastructure, controls, systems and people are in place throughout its business units. Key policies and procedures employed in managing operating risk involve segregation of duties, transaction authorisation, monitoring and financial and managerial reporting.

Financial risk management

Financial risks are managed within predetermined procedures and constraints as identified and detailed in policy manuals. Compliance is measured through regular reporting against these standards, internal audit checks and external audit verification.

Approval framework

The CSIR Board has adopted an approval framework which governs the authorisation processes in the CSIR. It deals with, inter alia, the construction of strategic plans, development of business plans and budgets, appointment of bankers and key service suppliers, appointment of personnel, approval of salaries and acquisition and disposal of assets. It also defines authority levels in relation to organisational position and is materially based on the respective domains.

Appropriate controls exist to ensure compliance with this framework. A comprehensive set of procedures exists to provide the necessary checks and balances for the economic, efficient and effective use of resources. The essence of this framework is that it is comprehensive, clear and unambiguous, and easy to assimilate and internalise.

Internal control

The CSIR Board has ultimate responsibility for the system of internal controls. The key controls required to ensure the integrity and reliability of financial statements have been identified in conjunction with the external auditors. Close co-operation between the external auditors and CSIR Corporate auditors ensures adequate and efficient audit reviews of the proper functioning of these key controls.

Based on an evaluation of key risks to the organisation, an annual audit plan is drawn up. The work programme that gives effect to the plan is reviewed by the Audit Committee at their November meeting and ratified or modified, as necessary.

Corporate Governance

(continued)

Employee participation

The CSIR strongly encourages effective and modern workplace practices and relationships to foster employee participation and work process involvement. Employee participation happens, for example, through self-directed teams, transformation action groups, union representation, a leadership development programme, technical and strategic focus groups and task teams, and employee satisfaction measurement processes.

Charter of Ethics and Organisational Values

The CSIR Board and Executive Management Board have approved and adopted a Charter of Ethics which reflects the organisation's commitment to a policy of fair dealing and integrity in conducting its business. The Charter, which incorporates the CSIR's Code of Conduct and links closely to its set of values, requires all employees to maintain the highest ethical standards, ensuring that business practices are conducted in a manner which, in all reasonable circumstances, is beyond reproach. Monitoring ethical behaviour is devolved to business unit level and transgressions are addressed by means of grievance procedures as contained in the CSIR's Conditions of Service.

Environmental management and occupational health and safety (EHS)

As a corporate citizen, the CSIR acknowledges its obligation to its employees and the communities it serves to conform to environmental, health and safety laws and internationally accepted standards and practices.

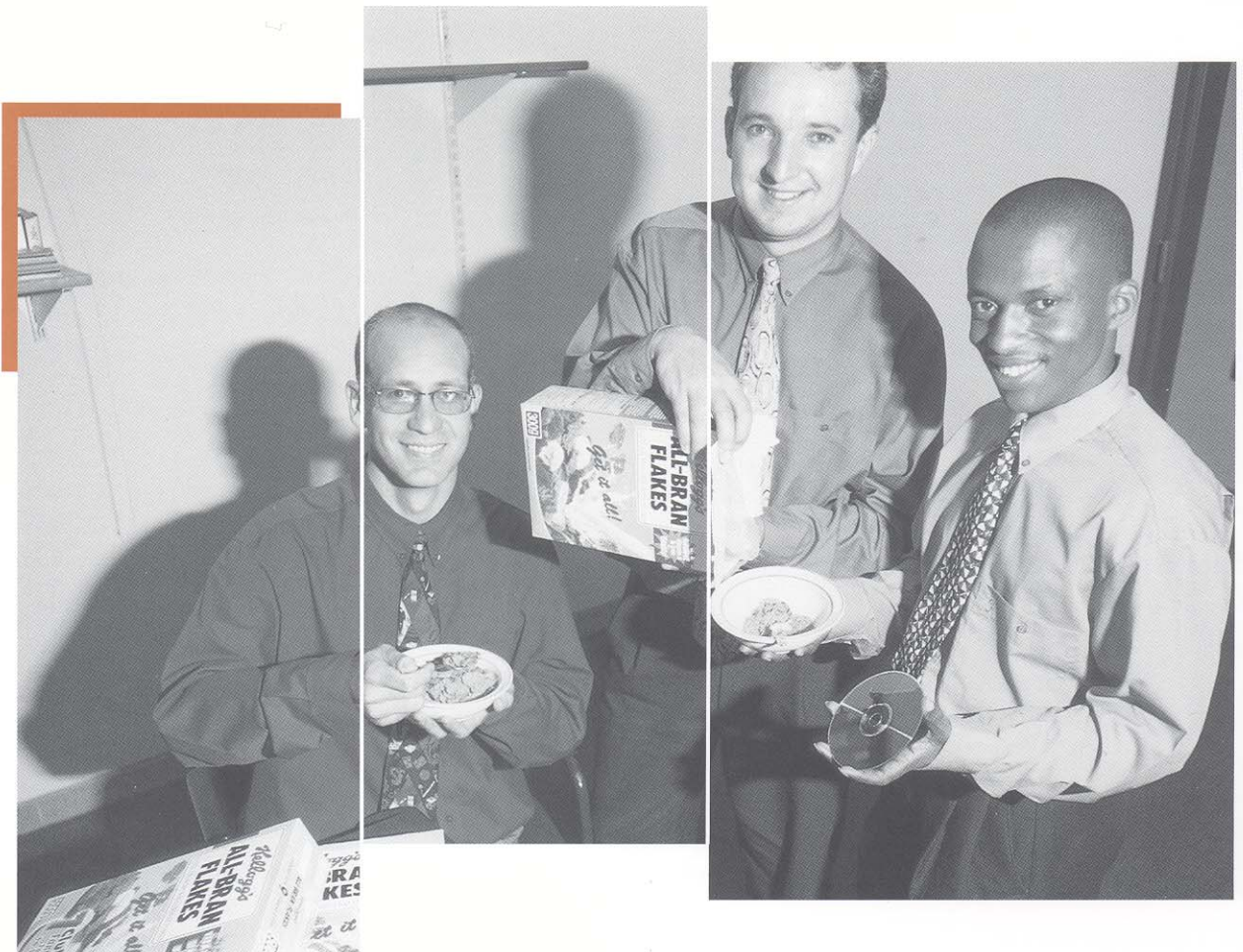
In 1997, the CSIR commenced with the implementation of the internationally recognised Environmental Management System, ISO 14001, which included the development, publication and adoption in 1998 of an Environmental Policy for application throughout the organisation at all its sites.

General

The CSIR acknowledges that systems of corporate governance should be continuously reviewed to ensure that they are sound and congruent to world-class standards in a way that is relevant to the business of the CSIR and its evolution.

We will continue to comply with all major recommendations of the Code of Corporate Practices and Conduct as set out in the King Report on Corporate Governance.

The teaming up of a strong commercial player, The Kellogg Co. of SA, and CSIR software engineers has resulted in a new software tool - The Kellogg's Get It All Vitality Software, a program which determines a nutrition blueprint based on individual input.





GOVERNANCE STRUCTURES

The relative complexity of the CSIR's business, in achieving a balance between medium and long-term initiatives and the present-day harvesting of such initiatives, requires three distinct structures that govern the affairs of the organisation, with a collective responsibility to provide effective corporate governance. These are the CSIR Board, the Executive Board and the Management Board.

CSIR Board

The CSIR Board approves the mission, strategy, goals, operating policies and priorities of the organisation and monitors compliance with policies and achievement against objectives. It does this by holding management accountable for its activity through monitoring, measurement and control of operations.

CSIR Board members are appointed for a term of three years by the Minister of Trade and Industry. With the exception of the President of the CSIR, all the members of the CSIR Board are non-executive. CSIR Board members are actively involved in, and bring independent judgement to bear on, Board deliberations and decisions.

The CSIR Board has the following committees: the Human Resources and Remuneration Committee, the Audit Committee, the Mergers, Acquisitions and Commercialisation Committee, and the Science and Technology Committee. These committees comprise

members of the CSIR Board and a Vice President ex-officio (see below).

The CSIR Board, whose current number of members meets the statutory minimum requirement, meets quarterly. For the year under review the Board met on 10 June, 4 September, 18 November 1998 and 26 February 1999.

Executive Board

The Executive Board has executive responsibility for the CSIR and consists of the Chief Executive Officer (CEO) and five Executive members responsible for the portfolios of Finance and Commercialisation; Human Resources; Technology for Development and Policy; Technology and Information; and Business Development. The Executive Board meets weekly.

Management Board

The Management Board is responsible for strategy implementation and managing the day-to-day affairs of the CSIR and its business units in accordance with the policies and objectives approved by the CSIR Board. This Board comprises the members of the Executive Board, together with the ten business unit directors (profiled in Technology Impact). The Management Board meets at least monthly.

The chief accountable officer of the CSIR is the President, whose address is given on the inside cover of this report.

CSIR Board Committees 1998/99

Committee	Members	Meeting dates	Purpose
Audit	Mr Eugène van As (Chairman) Mr Les Boyd Dr Dhiro Gihwala Mr Khomotso Phihlela Dr Geoff Garrett Mr Albert Jordaan (ex-officio)	4/6/98 5/11/98	Deals with all matters prescribed by Section 14(1) of the Reporting by the Public Entities Act. Controls the final review of key risk matters affecting the organisation. Determines the scope, and reviews and approves the annual audit plan and the work of the CSIR Corporate auditors. Acts in an unfettered way to understand the dynamics and performance of the organisation with no artificial boundaries created by protocol.
Human Resources and Remuneration	Dr Bill Venter (Chairman) Prof Anton Eberhard Mr Khomotso Phihlela Ms Lyndall Shope-Mafole Dr Geoff Garrett Dr Namane Magau (ex-officio)	19/5/98 12/8/98	Provides the vehicle for the CSIR Board to influence and control human resources and remuneration in the organisation. Determines human resource policy and strategy. Approves remuneration changes and bonus payments.
Mergers, Acquisitions and Commercialisation	Dr Bill Venter (Chairman) Mr Khaya Ngqula Mr Khomotso Phihlela Dr Geoff Garrett Mr Albert Jordaan (ex-officio)	22/9/98 13/11/98	Reviews the strategic business viability of any proposed merger or acquisition of significance. Reviews the principles involved in contractual arrangements. Advises on negotiating processes in merger, acquisition or commercialisation processes. Makes appropriate recommendations to the CSIR Board on whether the relevant acquisition or merger is in the interest of the stakeholders.
Science and Technology (established in financial year under review)	Prof Friedel Sellschop (Chairman) Prof Anton Eberhard Dr Dhiro Gihwala Dr Geoff Garrett Dr Adi Paterson (ex-officio)	19/5/98 15/12/98	Provides guidance and advice on the long-term trajectory and composition of the CSIR's science and technology portfolio in the context of the needs of the country. Ensures that key innovations and research processes are conducted effectively and benchmarked according to international best practice. Ensures that research outputs, organisational climate and credibility remain congruent with the role and objectives of the institution.

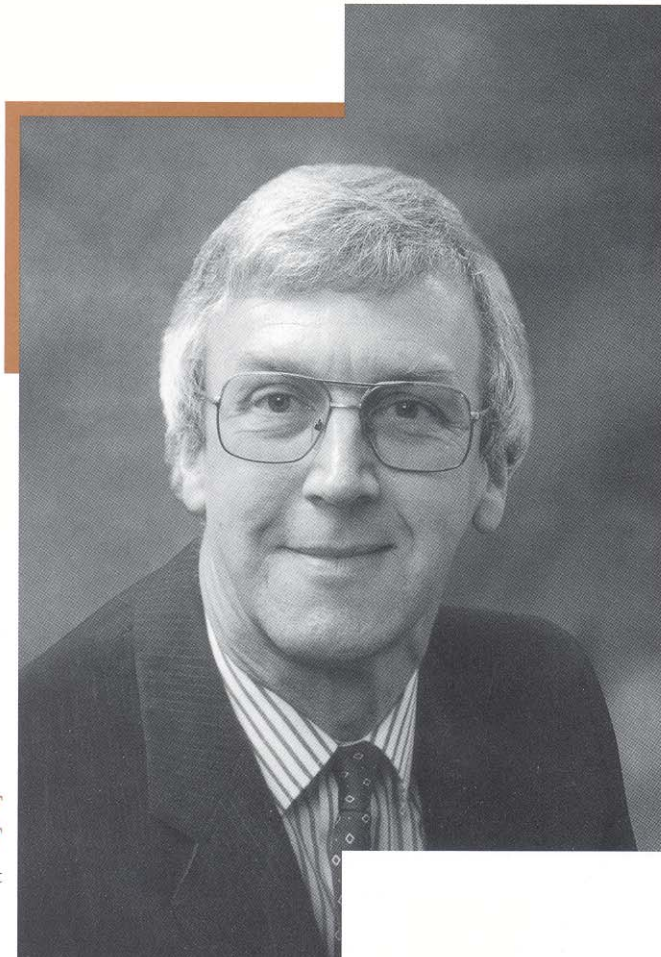
Our greater goal is excellence in science and technology to help South Africa take its place among the winning nations of the world

We have pleasure, on behalf of the CSIR Board, in submitting to Parliament, through the Minister of Trade and Industry, this report and the audited financial statements of the CSIR for the year ended 31 March 1999.

In the opinion of the CSIR Board, who fulfil the role of directors as envisaged by the Companies Act, Act 61 of 1973, the financial statements fairly reflect the financial position of the CSIR as at 31 March 1999 and the results of its operations for the year then ended.

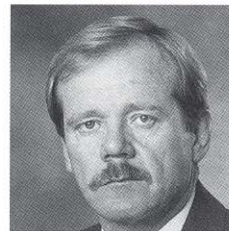
Introduction

Our world of science and technology, by its very nature, is dynamic, fast-moving and inescapably subject to change. As a proudly South African, outward-looking organisation, we find ourselves as much shaped by the forces of turbulent world markets and surging currents of social and political



DR GEOFF GARRETT
President

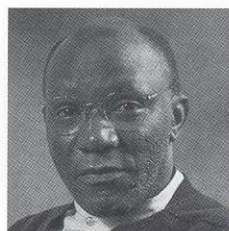
CSIR Executive Members



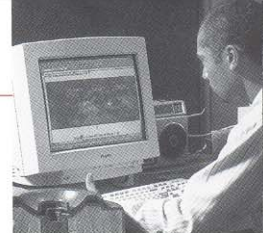
MR ALBERT JORDAAN
Finance and Commercialisation



DR NAMANE MAGAU
Human Resources



MR NEO MOIKANGOA
Technology for Development and Policy



transformation, as we have a role to play in shaping them. Within this context, we have emerged from a year of tough business conditions with our eye firmly on brighter horizons ahead.

We strongly believe that our strengths as an organisation mirror our strengths as a nation: a wide diversity of skills, cultures and perspectives, combined with proven ability to pool our energies and work together in pursuit of a greater goal. For the people of the CSIR, that greater goal is excellence in science and technology, allowing us to compete globally while helping to build a better world at home.

Acts and legislation

As a statutory research council, established by Government, the CSIR is governed by the Scientific Research Council Act (Act 46 of 1988, as amended by Act 71 of 1990). We were listed as a Public Entity in terms of the Reporting by Public Entities Act in 1992.

Our mandate

The CSIR Act records our mandate as follows: *"In the national interest, the CSIR, through directed and multi-disciplinary research and technological innovation, should foster industrial and scientific development, either by itself, or in partnership with public and private sector institutions, to contribute to the improvement of the quality of life of the people of South Africa."*

Function and objectives

The nature of our business

Within the framework of our mandate, we source and develop knowledge and technology that enables us to provide technology solutions and information

that support sustainable development and economic growth in the context of our country's national priorities.

The focus of our Parliamentary Grant investment remains centred around the key national imperatives, as defined by the White Paper on Science and Technology, namely: **creating competitiveness and employment, improving quality of life, developing human resources, ensuring a sustainable environment and promoting an information society.** These imperatives provide the macro-strategic framework within which we construct our business plan and business goals.

Operational priorities

The CSIR's five operational priorities are translated from its strategic priorities into quantifiable business goals, so that performance against the longer-term priorities can be measured. We do this by determining short-term quantitative measures at specific output and outcome levels, and measure our performance against these short-term goals.

Our business goals, therefore are to *grow our business, embed quality in everything we do, create an increasingly innovative and rewarding working environment for our people, make an impact on sustainable development and harness the information revolution.* Our performance against these goals is summarised below.

Goal 1: Growing our business

The total income for the year was R686,6 million, which was just 2,5% short of our targeted income of R704,1 million. The Parliamentary Grant was 3,2% lower than 1997/1998.

Growth in external contract income was adversely affected by reduced sales in the public sector. This was mainly due to constraints on public spending, particularly in the broader infrastructure and in the national safety and security sectors. Our Defence Force contracts were affected by a moratorium, which was only lifted in September 1998, resulting in additional cuts in defence R&D spending.

We achieved a net margin of R11,7 million (1,7% of income) against a budgeted R15,2 million (2,2% of income), despite the shortfall in income and the absorption of the start-up costs of the new CSIR Bio/Chemical Technologies business unit (resulting from the acquisition of the AECI Research and Development Department, as approved by the CSIR Board at its meeting in November 1998). Our final margin was positively affected by tight cost control and good cash management.

CSIR Executive Members *(continued)*



DR ADI PATERSON

Technology and
Chief Information Officer



DR ANTHOS YANNAKOU

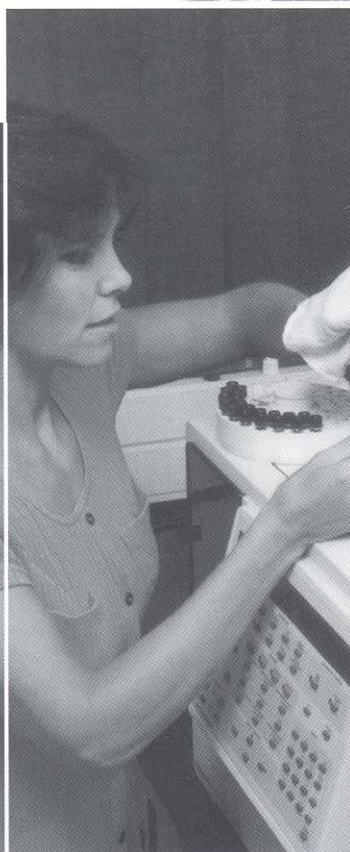
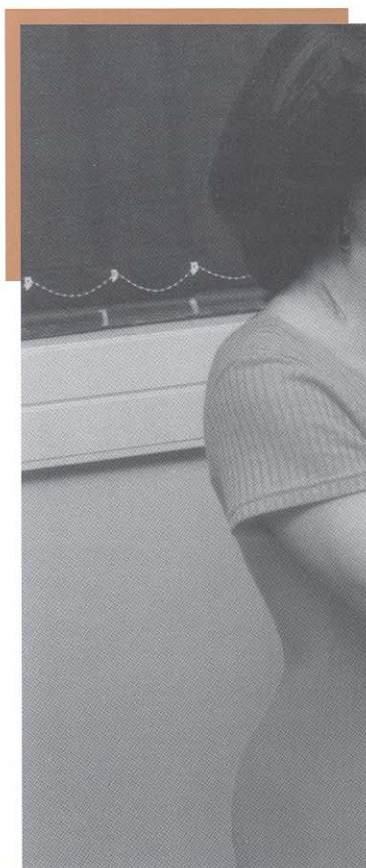
Business Development

Whatever the challenge, the people of the CSIR are making a difference, making their vision of a better tomorrow come alive

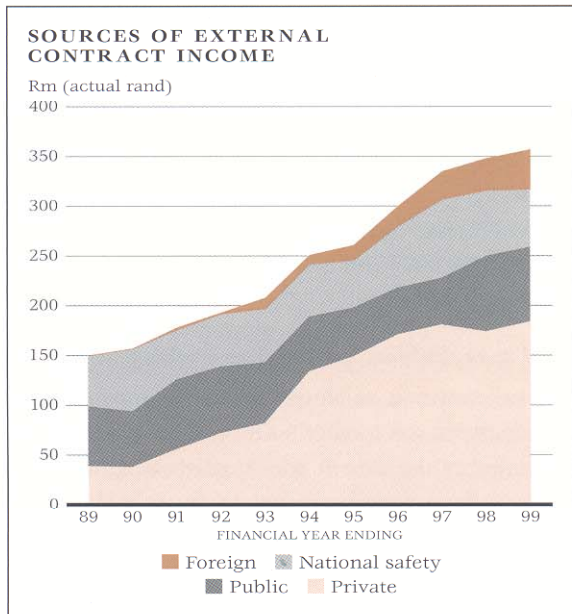
External contract income per sector 31 March 1999	5 year compound growth	1999 R'000	1998 R'000	1997 R'000	1996 R'000	1995 R'000
External contract income	7,2%	356 339	347 982	334 213	300 285	261 747
Private sector	6,6%	183 983	173 582	180 601	170 888	149 166
Annual growth		6,0%	(3,9%)	5,7%	14,6%	11,4%
Public sector	6,3%	74 965	76 223	46 567	47 073	49 446
Annual growth		(1,7%)	63,7%	(1,1%)	(4,8%)	(10,4%)
National safety and security sector	1,7%	56 729	64 967	78 247	60 952	47 465
Annual growth		(12,7%)	(17,0%)	28,4%	28,4%	(8,9%)
Other sectors (including Africa)	32,2%	40 662	33 210	28 798	21 372	15 670
Annual growth		22,4%	15,3%	34,7%	36,4%	55,9%

Internationally active

Major growth was again achieved in foreign income, which grew 12,2% beyond budget to R40,7 million (1997/98: R33,2 million). This reflects an increase of 22,4% (1997/1998: 15,3%), with a five-year compound growth of 32,2% per annum.



Using a Gas Chromatograph/Mass Spectrometer to provide specialist analysis services, such as elucidating accelerant residue in fire debris and quantifying volatile and semi-volatile organic contaminants in air, soil and water



During the year under review, several key international alliances have been cemented and our international networks further expanded. This included, *inter alia*, collaboration with scientific research bodies, such as the Netherlands Organisation for Applied Scientific Research (TNO). Some of our formal co-operation agreements include the CSIR (India), the Korean Institute of Science and Technology and the German National Research Centre for Information Technology (GMD). Other examples are highlighted in *Technology Impact*.

Provincial expansion

The CSIR's provincialisation drive was strengthened with the opening of additional offices in Pietermaritzburg (April 1998) and Richards Bay (September 1998). We remain confident that the process initiated in 1997, to transform the CSIR into a fully representative organisation with a market-related presence in all nine provinces, will add real value to our ability to assist employment creation initiatives in the provinces and help spur their development.

Active in the region

The CSIR's success in the Southern African Development Community (SADC) is strongly underpinned by our networks and alliances (including those with international aid agencies), as well as internationally funded projects and a focussed market and business development drive. Our positioning as a key provider

Financial indicators	Target	Actual 1999	Actual 1998
	R'000	R'000	R'000
Total income (excl investment income)	704 102	686 663	688 774
Growth	2,2%	(0,3%)	5,6%
Parliamentary Grant	313 500	325 469	336 255
Growth	(6,8%)	(3,2%)	10,6%
External operating income	390 602	361 194	352 519
Growth	10,8%	2,5%	1,2%
Expenditure	701 882	688 098	704 791
Growth	(0,4%)	(2,4%)	9,7%
Net margin	15 248	11 662	7 310
Growth	108,6%	59,5%	(89,4%)

of technical assistance to SADC will be further strengthened by the extension of our provincialisation infrastructure, which has a strong focus on business development, to the region.

Integrated projects

We are implementing capacities that will allow us to continuously take advantage of new opportunities opening up in the area of large integrated projects that require extensive partnering and collaboration both within and outside of the organisation. These include the Innovation Fund and THRIP (Technology and Human Resources for Industry Programme) projects and involvement in the Defence Procurement Industrial Participation Programme.

During the year under review, we secured R30,4 million in contract income for a three-year period from the Innovation Fund, acting as the lead agency in seven projects and participating in five others in a consortium role. Of the total amount, R12 million was secured for the 1998/99 financial year, with R10,2 million and R8,2 million respectively earmarked for the following two financial years. A major collaborative agreement was negotiated for a comprehensive research programme focusing on the challenges of deep-level mining ("Deepmine"), with THRIP being a significant funder alongside industry and the CSIR.

Major growth in tourism

Cognisant of tourism as a major growth sector for business development in South Africa that will impact on job creation, we have formed a cross-cutting tourism task team to link with Government and business sectors and contribute to conceptualisation and implementation in areas such as information dissemination, development of systems and design, and providing decision support.

Seeing beyond
the everyday,
to what, through science
and technology, will
be a better
future
for us all

Actively helping to curb crime

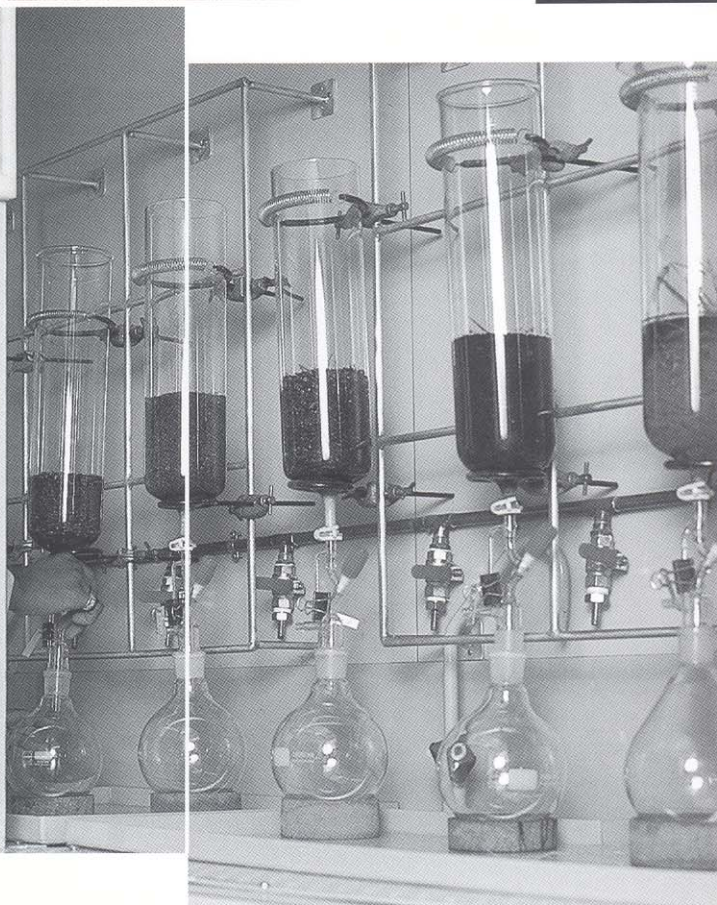
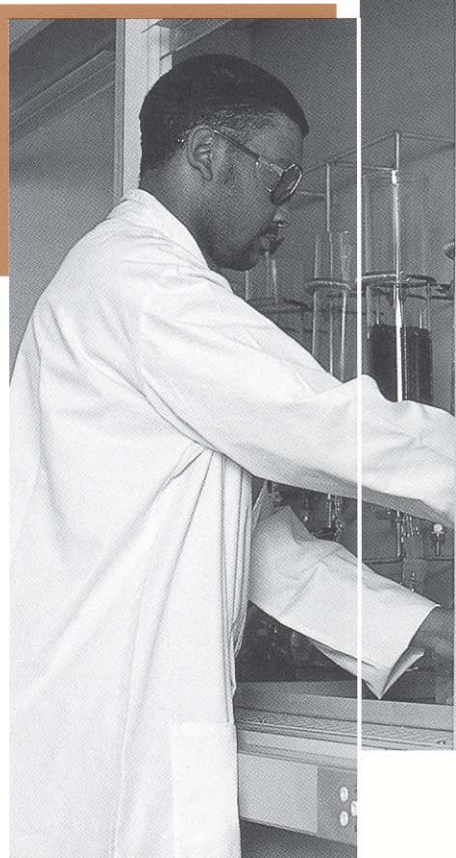
The CSIR's Crime Prevention Centre consists of four focus areas, namely safer communities; helping to improve the criminal justice system; providing technology support; and curbing crime in commerce and industry. Our team has played a substantial role in developing technology to assist in solving and preventing high-profile crime. Examples are highlighted in *Technology Impact*.

Goal 2: Embedding quality in everything we do

As we continue to develop our approach to the management of quality, our emphasis is on the reduction of the cost of poor quality, benchmarking and continuous improvement.

Following the CSIR's use of the Malcolm Baldrige National Quality Award (MBNQA) in 1997, we are now actively involved with pioneering the

The CSIR's bioprospecting facility allows plant extracts to be produced under controlled and environmentally safe conditions. These extracts are tested for commercially important biological properties such as anti-cancer activity in the screening laboratories of the CSIR and its collaborators. The Bioprospecting Programme aims to add value to South Africa's genetic resources and indigenous knowledge systems through the discovery of novel chemical products such as pharmaceuticals and pesticides.





South African Excellence Foundation (SAEF) self-assessment process. Our Aerotek business unit (now Defencetek) completed a business process and results assessment, organised by the SAEF for the national quality awards, and was adjudged the winner of the Defence Industry category.

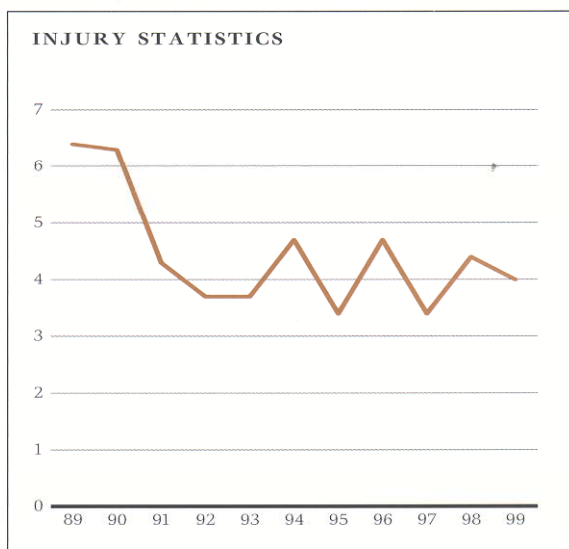
During the course of the year, one of our business units obtained ISO 9001 accreditation for operating according to an internationally recognised quality management system.

In 1998, we were also privileged to be one of the six finalists for the Corporate Governance Award, jointly sponsored by Deloitte & Touche and the Johannesburg Stock Exchange (JSE), which recognises South African organisations that practice good governance.

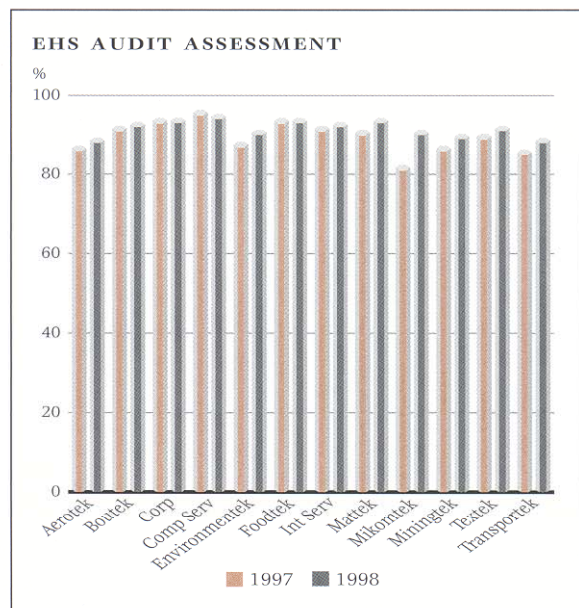
Customer satisfaction

During 1998/1999 we re-engineered our approach to customer satisfaction. While the "classic" customer satisfaction surveys will continue to serve us well, systems are being implemented to accommodate complementary recognition of the importance of "Moments of Truth" where key client interactions take place. The 1999 benchmark study will be undertaken in the new financial year (our previous benchmarks were done in 1995 and 1997).

40% and 60% respectively towards our final EHS audit result. The aggregate for individual ratings by business units during 1998 was 92% (1997: 89%). The disabling injury frequency rate for 1998 was 3,8 (1997: 3,9) against the aim of achieving an average of less than 5 per annum.



Two of our internal service groups and a business unit were registered in accordance with the international SABS ISO 14001 code for an Environmental Management System.



Goal 3: Creating an increasingly innovative and rewarding working environment

The CSIR's human resource strategies are closely linked to our organisational strategies and are oriented towards improving individual and organisational performance, while aiming to achieve the demographic targets of our Human Resource 2001 plan.

In response to this goal, our focus for 1998 was on transformation to enhance innovation, on restructuring the organisation for growth and global competitiveness, on developing leadership, and on strategic partnering and alliances to achieve our business goals.

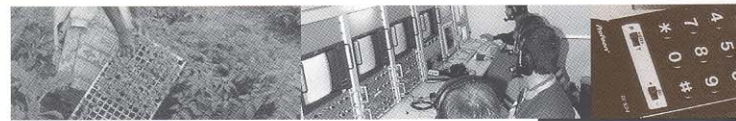
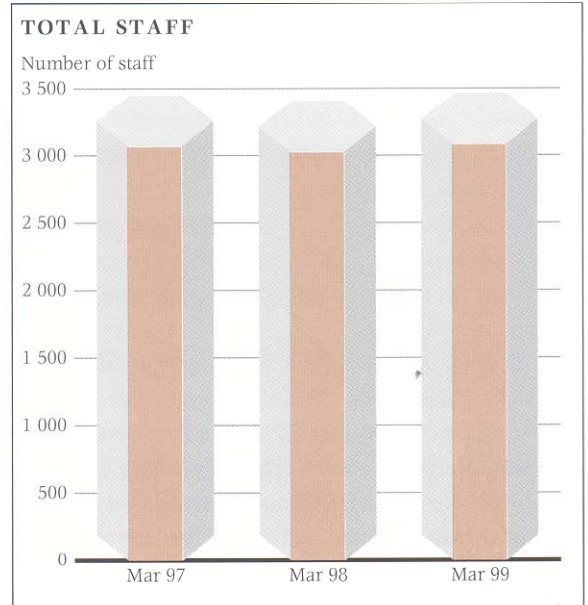
Changing the face of the organisation

Our total staff complement as at March 1999 was 3 082, slightly up on the previous year (1997/98: 3 026). This result was 0,96% short of the planned staff complement for the specific period and can mainly be ascribed to a slowing down of recruitment in the light of the difficult economic climate.

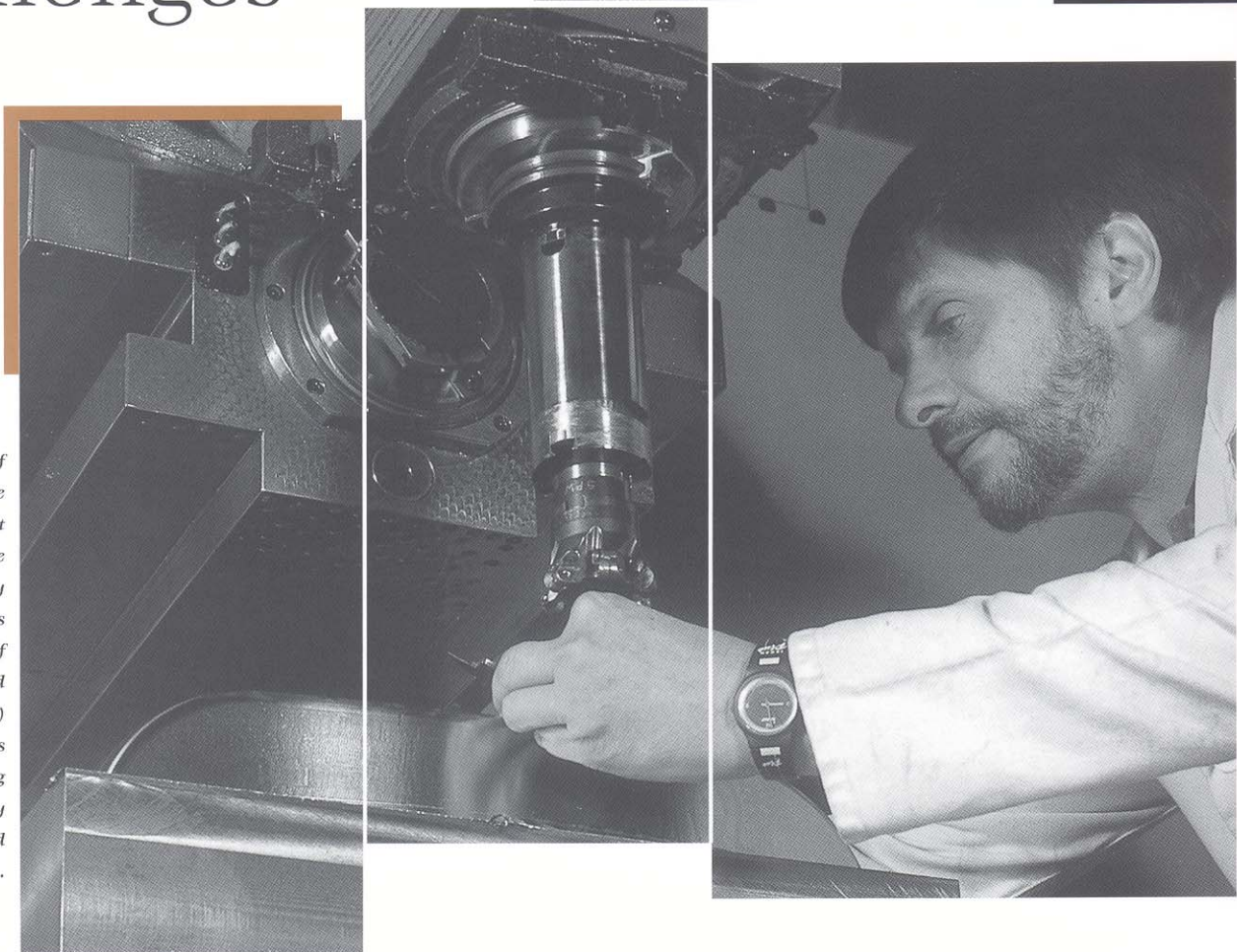
Being environmentally responsible

Unannounced and announced environmental, health and safety (EHS) audits were conducted and counted

Combining creative energies and leading-edge technologies in the quest to provide real-world solutions to everyday challenges

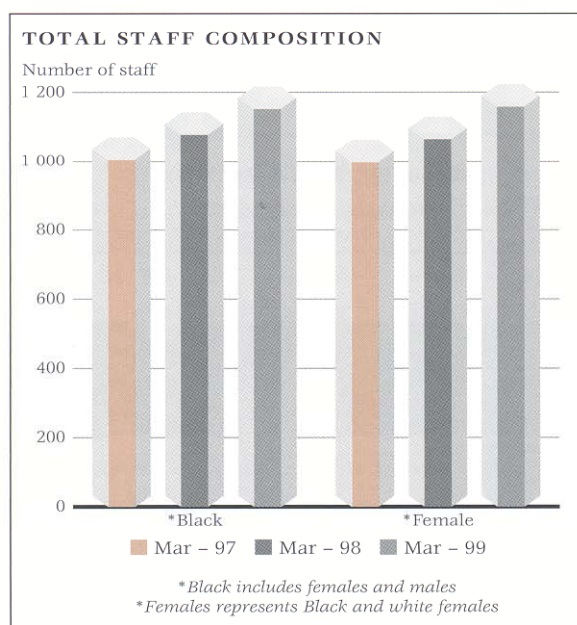


CAD/CAM forms part of the comprehensive product development service offered by the CSIR. Numerically controlled machining is an application of Computer Aided Manufacturing (CAM) Technology at the CSIR's high precision machining centre used extensively for the purpose of mould making within the CSIR.





We achieved positive results with our diversity targets. The distribution of CSIR employees by race and qualifications, as well as the racial and gender composition of our professional staff, at the end of March 1999 was: 1 152 Blacks (37,4% of the total staff complement versus 35,6% in 1998) and 1 158 females (37,6% of the total staff complement, versus 35,2% in 1998). Of the total number of professional staff in the CSIR, 18,3% were Black (1998:16,1%) and 28,7% were female (1998: 25,8%).



Seen within the context of ongoing restructuring, it is encouraging that we were on target with our professional staff complement, which comprised 41,6% of the total, against the target of 40,7% for March 1999. This highlights the ongoing challenge of recruiting and retaining professional staff in a very competitive labour market, especially Black scientists and technologists. Most of the Black professionals who have left the CSIR did so because of enhanced career options outside the mandate of the organisation.

The average personnel turnover for the 1998/1999 financial year was 20,5% (1997/98: 18,3%), including an unavoidable turnover of 15,4% (1997/98: 11,3%). This was mainly attributed to retrenchments, contract completions and retirements. The turnover rate should be seen within the context of the necessary restructuring during the period under review.

CSIR bursary programme

Our bursary scheme continues to be an integral part of building capacity and meeting our employment equity targets. During the year under review, progress in improving past imbalances in the bursary programme continued. Of our 149 CSIR bursars, 71% were Black and 34% were female (1997/98: 65% Black and 29% female).

As part of our long-term human resources planning, students are encouraged to take postgraduate studies. In 1998, 15% of our bursars were postgraduates.

Training for excellence

Our human resources development approach supports our business strategy and complements both our career development and performance management policy frameworks.

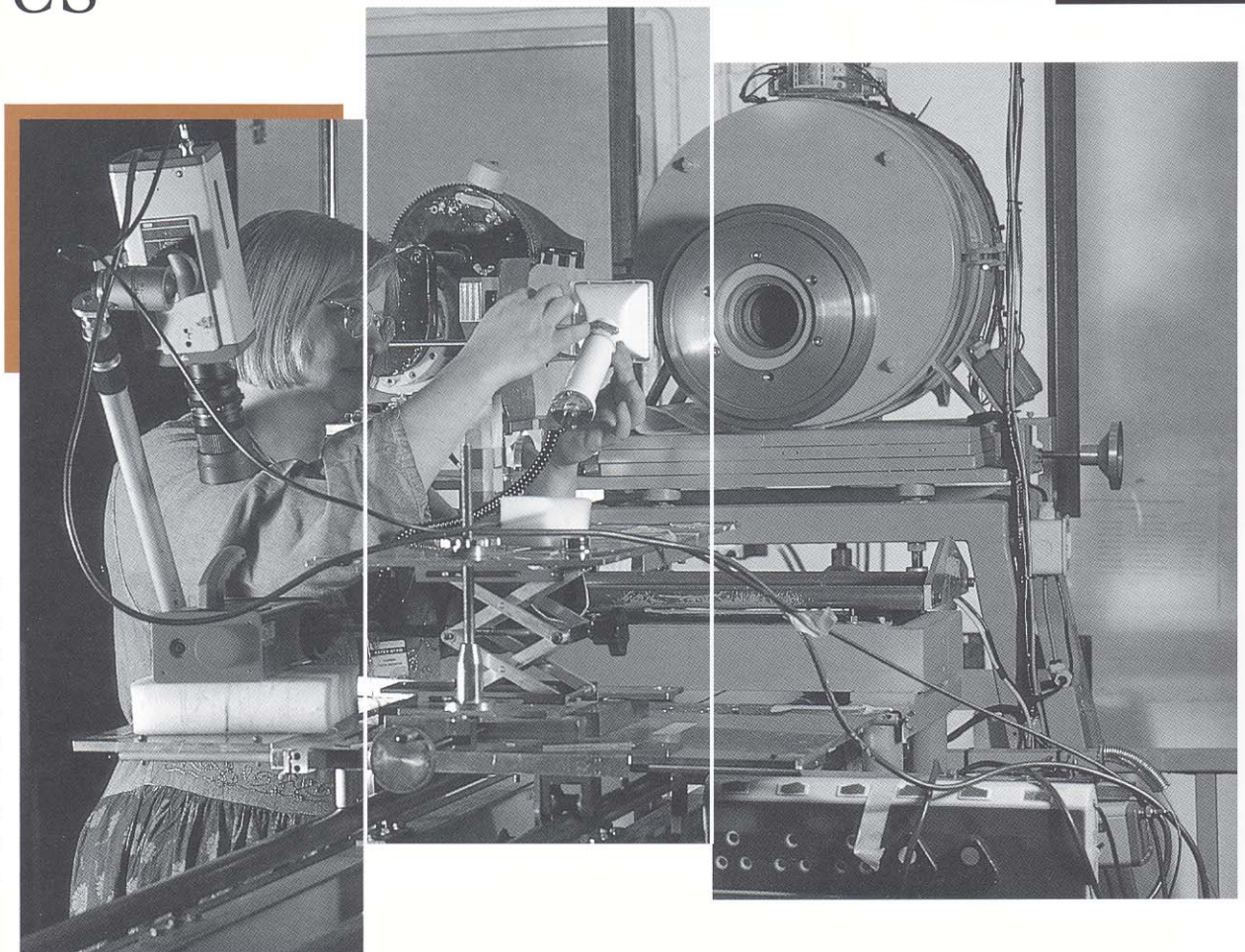
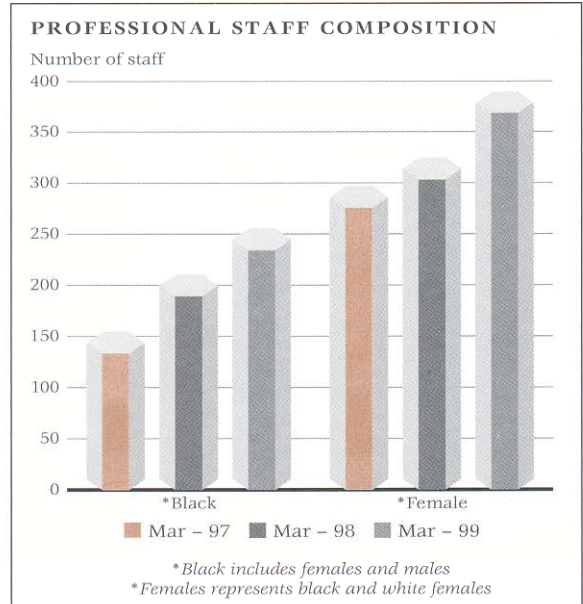
As part of this approach, the CSIR Innovation Leadership and Learning Academy (CILLA) was launched in 1998, to operate as a virtual human resource development mechanism, catering for both internal and external training needs. CILLA has already linked up with international and local education institutions to address the identified skills development and training needs for the CSIR. It is envisaged that CILLA will serve as an important mechanism for contributing to the development of the local innovation base to promote competitiveness in South Africa.

The CSIR Advanced Leadership Programme (ALP), now in its fifth year of operation and aimed at equipping the organisation with leaders for the future, accommodated a total of 43 candidates, of whom 19 were Black and 16 female (1997/98: 39 candidates, of whom 13 were Black and 16 female).

Through a Technology Leadership Programme (TLP), which aims to enhance employee understanding of the social and economic value of technology, we accommodated 16 CSIR professionals, of whom three were Black and four were female (1997/98: 13 CSIR professionals, of whom seven were Black and six female).

Our three-year in-house adult basic education programme, which ends in December 1999, will by that time have provided basic reading, writing and arithmetic skills to 120 employees. Ongoing training of staff members in mathematics and science continues, as the need arises.

Driven by excellence, leadership and global competitiveness to make a meaningful and enduring difference in people's lives



Medical safety measurements are vital in fields such as radiation dosimetry for employees working in radiation areas. The CSIR's National Metrology Laboratory is calibrating radiation protection instrumentation.



Measuring our internal climate

A climate survey to determine our employee satisfaction levels is conducted at least annually. These surveys constitute a measurement instrument for assessing the alignment of our human resource management plans and processes with our overall organisational goals and strategy. Staff complete questionnaires that address the domains of job fulfilment, organisational climate, employment equity, leadership and organisational effectiveness. We use the consolidated results to derive an overall "satisfaction index" for each business unit, as well as for the corporate and service units. Targets are set and the feedback received provides a focus for management attention.

The organisational climate, as indicated by the November 1998 Employee Satisfaction Survey (ESS) results, continued to show improvement. The overall index was 71% (1997/1998: 70%), which reflected positive growth in staff satisfaction. This is particularly noteworthy, as a level of uncertainty did exist among staff as a result of restructuring and ongoing change in their work environments.

High-level management discussions were held with NEHAWU to facilitate the organisation's progress in the restructuring processes that were undertaken during 1998/1999 (such as creating the Manufacturing and Materials Technology and Defence Technology business units).

Medical aid scheme

The CSIR's own medical aid scheme came into effect on 1 April 1997. The objective for the establishment of an own scheme for the organisation is to provide sustainable health care and at the same time limit costs to a level which is affordable. The scheme is based on managed health care principles, with a strong emphasis on co-responsibility between employer and employee. The fund was administered by Visimed until 31 March 1999 and governed by a Board of Trustees consisting of Mr Albert Jordaan (Chairman), Dr Namane Magau, and Ms Suzette Harmse. Discovery Health took over the administration of the fund on 1 April 1999.

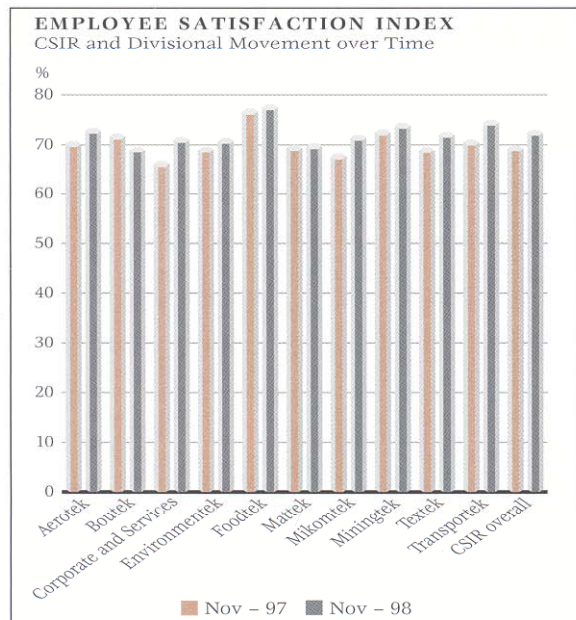
Pension fund

Our pension fund is registered in terms of the Pension Funds Act, Act 24 of 1956, and is a defined contribution plan. In a period of turmoil in the markets, where funds had to substantially adjust their values downwards, our fund performed well compared to similar funds, showing zero growth. The fund is also governed by a Board of Trustees, consisting of Mr Albert Jordaan (Chairman), Ms Suzette Harmse, Ms Helena Heystek, Ms Paula Norman, Mr Philip Masemola, Mr Daniel Mosito, Mr Thabo Pooe and Mr Gerhard Smith.

Goal 4: Making an impact on sustainable development

We continued to make a significant impact on sustainable development, empowerment and job creation in South Africa during the year under review, through our technology transfer in small business development initiatives, and developing human resource capacity in science and technology.

The two pilot high-impact integrated projects (HIIPs) at Lubisi (Eastern Cape) and Manguzi (KwaZulu-Natal) have evolved into instant technology platforms, enabling communities to engage in sustainable wealth-generating and job-creating economic activities. The Dutch Government has identified the HIIP at Lubisi as a possible economic engine to drive the development of a sustainable village model.



Labour relations

The impact of the new labour and related legislation was thoroughly evaluated and we aligned CSIR policies and practices to accommodate the new requirements.

We successfully concluded our wage negotiations with NEHAWU. The recognition agreement between the CSIR and NEHAWU is currently being renegotiated.

Our strengths
as an organisation, mirror our
strengths as a nation
in bringing together
diverse skills,
cultures and
perspectives
in pursuit of a
greater
goal

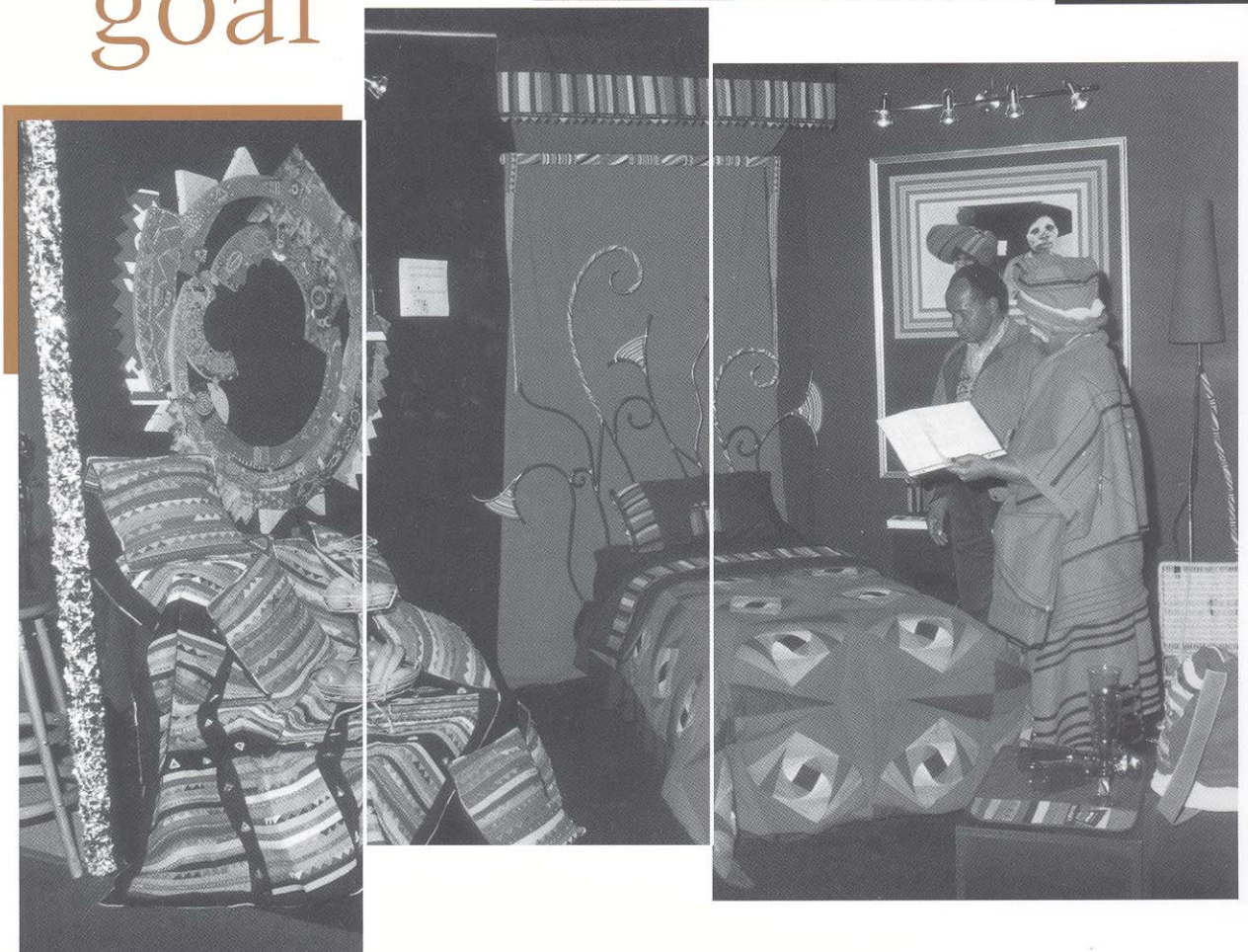
Under the umbrella of the National Manufacturing Advisory Centre (MAC) – a partnership between the CSIR, the Ntsika Enterprise Promotion Agency, DANIDA (the Danish funding agency) and the National Productivity Institute – the pilot MACs in Durban (DUMAC) and Port Elizabeth (PERMAC) now extend advisory support to a significant number of small businesses.

Helping to create an understanding of science and technology

The CSIR was a major contributor to the Department of Arts, Culture, Science and Technology's (DACST) *Year of Science and Technology* during 1998. Our activities included a launch function attended by approximately 8 000 scholars at the CSIR site in Pretoria, participation in the DACST core activities by way of exhibitions, acting as the lead Council in



CSIR's Textile Technology Research, Design and Product Development Centre assists business and community groups to develop textile projects. The aim is to combine indigenous textile skills, business investment and technical training to help improve the quality and competitiveness of traditional crafts.





the DACST thrust on information technology, which was rolled out in three provinces, and staging a science and technology laser theatre event in all provinces. We received a special award from DACST in acknowledgement of our contribution to the year's activities. The CSIR was also part of the Science Councils/DACST initiative that launched the Science and Technology Journalism Award for S&T publicity generated during the Year of Science and Technology.

Goal 5: Harnessing the information revolution

During 1998/1999, the CSIR initiated an Information Technology (IT) review that was conducted by a team of local and international experts. The review indicated that IT is a core competence that needs to be continually strengthened and that we should take a pro-active leadership role in adopting and adapting IT for southern Africa.

We believe that these aims can be met through focusing on increasing the IT intensity of our business units, providing leadership in "harnessing the information revolution", and working towards achieving a higher indigenous R&D component in South Africa (as exemplified by our development and subsequent sale of technology to M-Web).

Progress in this area during the year under review included a variety of initiatives such as the introduction of a Virtual Reality Centre, developing models for knowledge management, further investment in the Satellite Application Centre and strengthening and clarifying the position of our Information and Communications Technology business unit as a core, externally orientated IT business unit in the organisation.

Year 2000 compliance

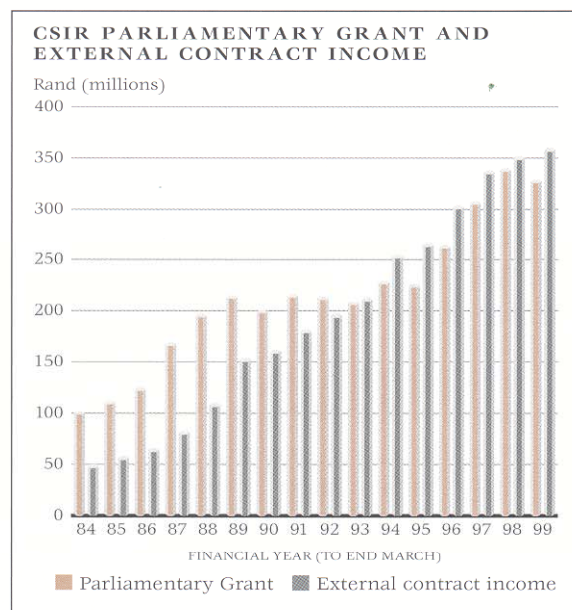
During 1998/1999, our efforts continued to ensure Year 2000 (Y2K) compliance of all CSIR computer and embedded systems. Our corporate enterprise systems are now compliant in terms of the standards set by the CSIR Y2K policy, and our business unit systems are in the process of remediation. We plan to complete the compliance process by October 1999. As part of the external audit process, a review of the Y2K procedures was performed. The auditors did not express an opinion concerning our Y2K compliance.

Managing our Parliamentary Grant

The Parliamentary Grant allocated to the CSIR for the 1998/99 financial year amounted to R325,5 million

(1997/1998: R336,3 million), which represented a decline of 3,2% in nominal terms and close to 10% in real terms.

This grant continues to be the key investment resource of the CSIR. We use it to create competence and capacity to provide technology solutions and information to clients and stakeholders in the service of the nation.



During the year under review, we further refined our comprehensive approach to technology management and the investment of the Parliamentary Grant. Activities in this area have been internationally benchmarked and have elicited extremely positive comments during previous review processes of the organisation. With 47,3% of our income funded by the Parliamentary Grant, the growth in earnings from external sources compares favourably with similar international institutions. Few international parastatal research organisations have the ability to generate more than 50% of their operating income externally.

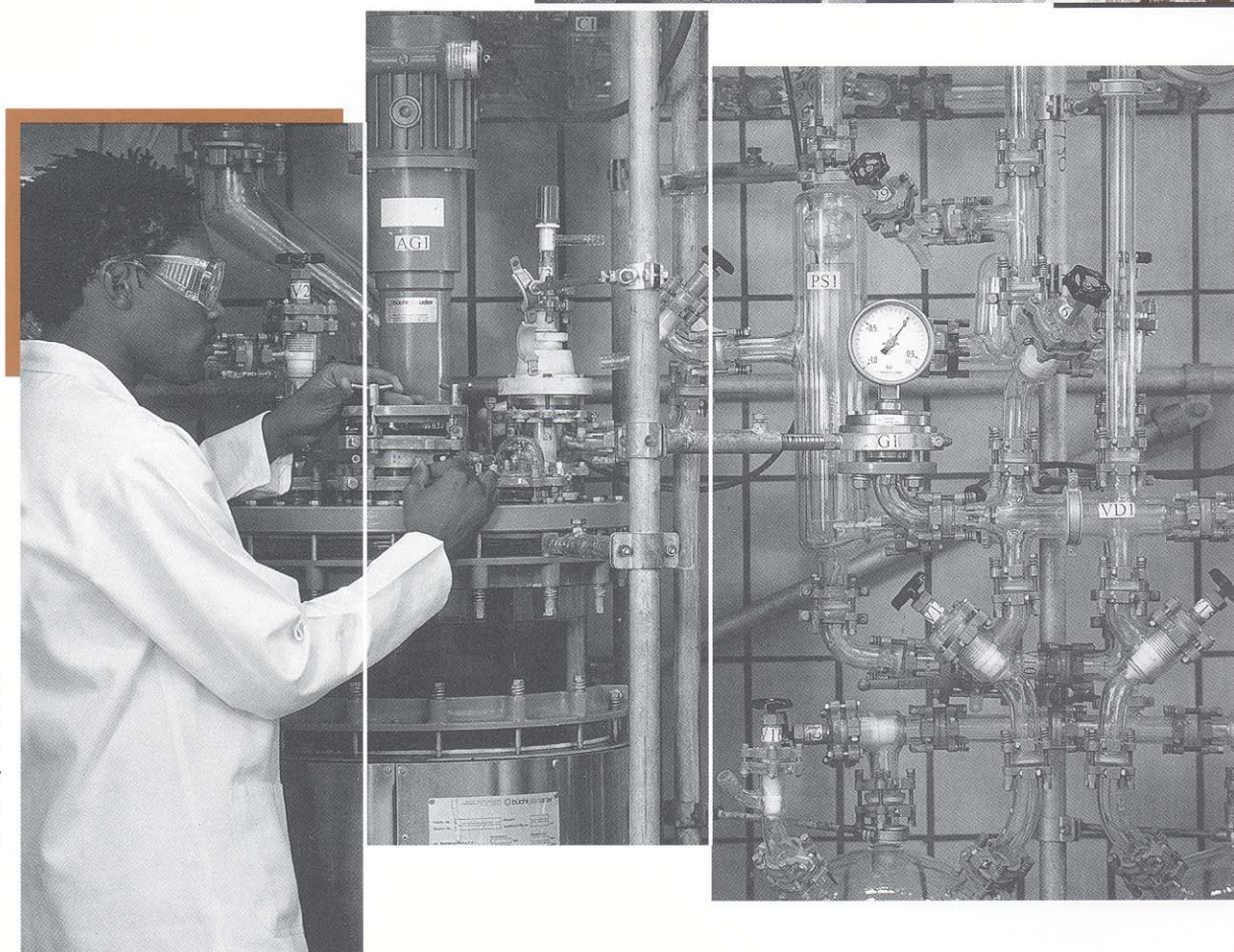
Organisation changes

The CSIR Board approved in August 1998 (for implementation in April 1999), that relevant parts of three of our business units (Materials Science and Technology, Aeronautics and Manufacturing Technology and Information and Communications Technology) be restructured to form two new business units: Manufacturing and Materials Technology, and Defence Technology.

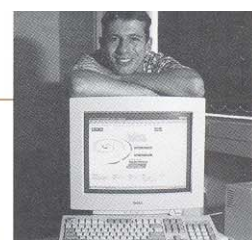
Discovering new solutions, encouraging innovation, building alliances, expanding the frontiers of knowledge, - this is the launch-pad for our journey into tomorrow

Changes to our management board

During the year under review, Dr Brian Armstrong was appointed Director of the Information and Communications Technology business unit, and Mr Philip Hendricks Director of the Roads and Transport Technology business unit. This followed the transfer of Dr Hoffmann Maree to become Director of the new Manufacturing and Materials Technology business unit (effective 1 April 1999), and Mr David Bath to become Director of the newly acquired Bio/Chemical Technology business unit (previously AECI R&D Department), effective 1 February 1999. Mr Neo Moikangoa, whose executive portfolio includes Technology for Development and Policy, assumed the acting Directorship of the Building and Construction Technology business unit, following the resignation of Mr Gaby Magomola.



Innovative and competitive chemical processes are undertaken for the manufacture of speciality and fine chemicals in sophisticated bench scale glass plants.



Acquisitions

The CSIR acquired AECI's R&D Department with effect from February 1999. This new CSIR business unit (Bio/Chemical Technologies) is a R50-million, 143-person operation with strong competencies in biotechnology, chemistry and processing. The unit was acquired after an investigation undertaken at the request of Minister Alec Erwin (Trade and Industry). The CSIR Board's approval was obtained in November 1998.

Also at its meeting in November 1998, the CSIR Board approved the formation of Snowden Mining Industry Consultants, a foreign entity in which the CSIR is an equity partner. This followed a thorough study by the Mergers, Acquisitions and Commercialisation Committee of the CSIR Board, in response to the significant and rapid movements in the South African mining industry. We also recognised the importance of extending the range of services of our Mining Technology business unit without developing extensive consulting capacity, yet protecting and optimally benefiting from key technical skills and competencies developed in this business unit over many years.

Over the last three years, our Materials Science and Technology business unit identified international opportunities in pipeline corrosion services, resulting from an almost complete saturation of the local market. The CSIR Board approved the formation of CSIR North America Incorporated in February 1998.

Other key initiatives

Commercialisation

During 1998/1999, new commercialisation models and a policy were developed and implemented. This included CSIR Board approval for the establishment of a CSIR-managed technology venturing company out of which will flow a number of ventures during 1999. This approach should enhance our ability to transfer new technologies into new markets, whilst our ongoing support can still add value to the core technology.

Our subsidiaries

The activities of the CSIR's subsidiaries, the South African Inventions Development Corporation (SAIDCOR) and the operating subsidiary Technology Finance Corporation (Technifin) are, respectively, to

invest in and develop research and implement and transfer technology to industry by licensing new inventions, and to provide finance to develop technology and venture capital to exploit it. The aggregated deficit of the subsidiaries amounted to R121 000.

Post-balance sheet events

No material facts or circumstances have arisen between the dates of the balance sheet and production of this report which affect the financial position of the organisation as reflected* in these financial statements.

Forward to the future

As we move forward into the 21st century, with our business priorities firmly in place, we are putting renewed focus on the need to consolidate our strengths, address our shortcomings, build strong new alliances, encourage innovation and enhance our reputation as a globally-competitive organisation with roots in a changing South Africa. We will continue our efforts to create a better, bolder, more profitable tomorrow that will help to turn this nation and our organisation, into role-models for the world.

Board approval

The annual financial statements of the CSIR for the year ended 31 March 1999, as set out on pages 14 to 51 of this report, have been approved by the CSIR's executive management and the CSIR Board at its meeting held on 9 June 1999. The Board is of the opinion that the CSIR is financially sound and operates as a going concern.

These statements are signed on behalf of the CSIR Board by:



Dr William P Venter
CSIR Board Chairman



Dr Geoff G Garrett
CSIR President

Five-year Financial Review

31 March

	1999	1998	1997	1996	1995
	R'000	R'000	R'000	R'000	R'000
Financial indicators					
Total reserves	365 217	353 555	346 245	460 574	417 189
Long-term liabilities	14 350	—	—	—	—
Total assets	542 583	490 212	453 862	566 927	555 248
Net assets	379 567	353 555	346 245	460 574	417 189
Income and expense indicators					
Parliamentary grant	325 469	336 255	304 030	260 128	233 314
External operating income	361 194	352 519	348 337	305 980	268 399
Expenditure	688 098	704 791	642 222	557 608	529 808
Investment income	13 097	23 327	58 526	34 885	31 706
Net income	11 662	7 310	68 671	43 385	3 611
Cash flow					
Net cash flow from operating activities	83 755	57 645	73 043	36 801	40 493
Net cash outflow from investing activities	(108 643)	(48 081)	(43 544)	(30 470)	(40 742)
Net cash flow from financing activities	14 350	—	(175 068)	—	(317)
Cash and cash equivalents beginning of year	54 322	44 758	190 327	183 996	184 562
Cash and cash equivalents end of year	43 784	54 322	44 758	190 327	183 996
Ratio analysis					
Asset management					
Net asset turn	1,84	2,01	2,05	1,30	1,28
Return on net assets	3,07%	2,07%	19,83%	9,42%	0,87%
Current ratio	1,18	1,51	1,68	2,88	2,21
Performance					
Total income (excluding investment income) per employee	223	228	213	177	187
Total external operating income per employee	117	116	114	96	100
Net cash generated from operating activities per employee	27	19	24	12	15
Independence ratio	53,49%	52,78%	57,23%	56,72%	56,26%

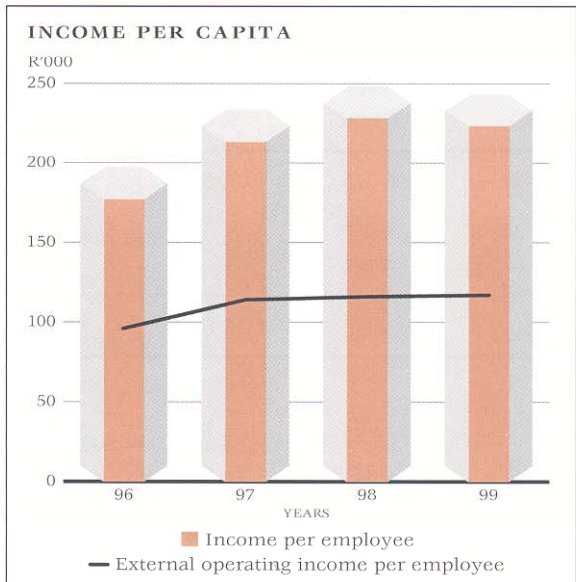
Definitions

Net asset turn – Total income (including investment income) divided by net assets

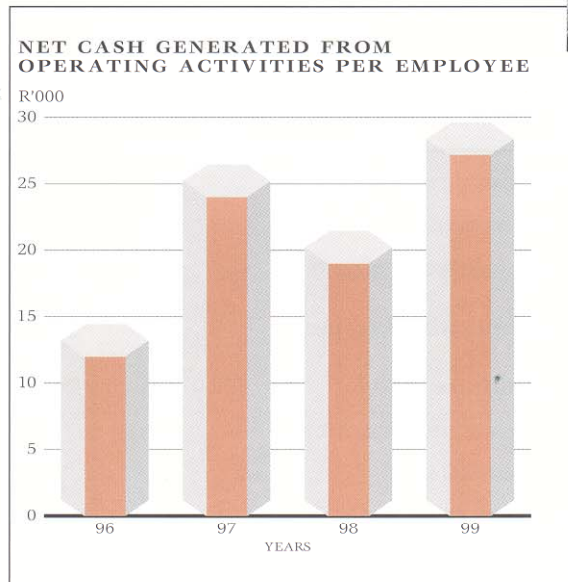
Return on net assets – Net income expressed as a percentage of net assets

Current ratio – Current assets divided by current liabilities

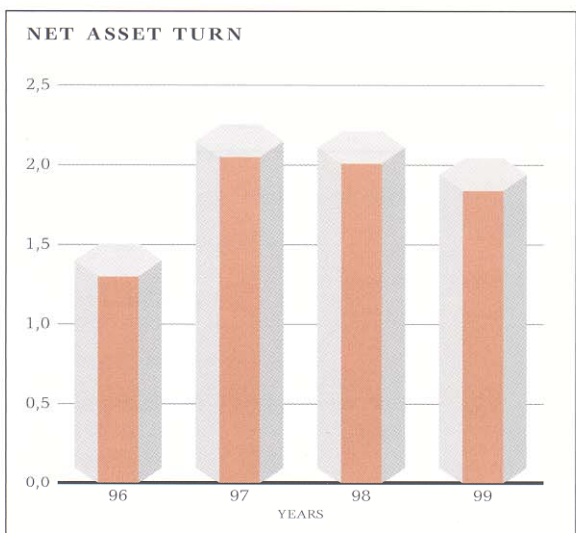
Independence ratio – Total external income (including investment income) divided by total income



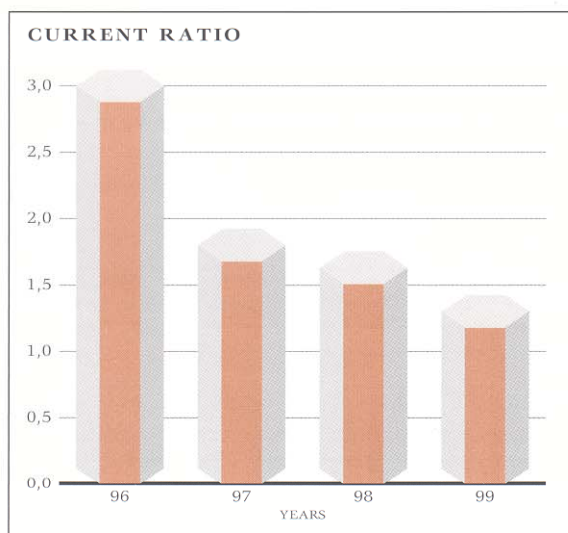
Income per employee showed a slight decline in line with the low growth in total income.



Net cash generated per employee continues to improve due to improved management of current assets and liabilities.



The decline in the net asset turn is the result of the decrease in the Parliamentary Grant coupled with increased expenditure on property, plant and equipment to enhance our research and development capabilities.



The current ratio declined due to an increase in current liabilities (advances received).

Income Statement

for the year ended 31 March 1999

	Notes	GROUP		CSIR	
		1999 R'000	1998 R'000	1999 R'000	1998 R'000
Turnover	2	696 783	691 575	685 934	687 800
Other income		677	974	729	974
Profit on disposal of patents		—	3 316	—	—
Total operating income		697 460	695 865	686 663	688 774
Expenditure					
Employees' remuneration		383 767	344 834	382 017	343 654
Depreciation	6	37 130	31 231	36 951	31 193
Operating expenses		275 818	333 141	264 560	328 589
Loss on disposal of property, plant and equipment		4 570	1 357	4 570	1 355
Total expenditure		701 285	710 563	688 098	704 791
Net operating deficit for the year before investment income	4	(3 825)	(14 698)	(1 435)	(16 017)
Income from investments	7	14 663	23 839	13 097	23 327
Net surplus for the year		10 838	9 141	11 662	7 310
Accumulated funds at the beginning of the year		331 149	322 008	343 555	336 245
Accumulated funds at the end of the year		341 987	331 149	355 217	343 555



Balance Sheet

31 March 1999

	Notes	GROUP		CSIR	
		1999 R'000	1998 R'000	1999 R'000	1998 R'000
Capital employed					
Distributable reserves					
Total accumulated funds		351 987	341 149	365 217	353 555
Accumulated funds		341 987	331 149	355 217	343 555
Self-insurance fund	14	10 000	10 000	10 000	+10 000
Non-distributable reserve					
Foreign currency translation reserve		62	—	—	—
Long-term liabilities	12	18 788	7 059	14 350	—
Total capital employed		370 837	348 208	379 567	353 555
Employment of capital					
Property, plant and equipment	6	306 234	240 958	305 441	240 815
Investments	8	33 138	31 424	30 000	30 000
Interest in subsidiaries	5	—	—	14 874	12 378
Net current assets		31 465	75 826	29 252	70 362
Current assets		199 743	214 365	192 268	207 019
Accounts receivable	9	113 680	127 779	112 343	126 499
Inventory and contracts in progress	10	36 536	26 268	36 141	26 198
Cash and cash equivalents		49 527	60 318	43 784	54 322
Current liabilities		168 278	138 539	163 016	136 657
Advances received	11	48 777	7 442	48 777	7 442
Accounts payable and provisions		119 501	131 097	114 239	129 215
Total employment of capital		370 837	348 208	379 567	353 555

Cash Flow Statement

for the year ended 31 March 1999

	Note	GROUP		CSIR	
		1999 R'000	1998 R'000	1999 R'000	1998 R'000
Cash flow from operating activities					
Cash receipts from external customers		344 191	334 824	342 328	342 428
Parliamentary Grant received		325 469	336 255	325 469	336 255
Cash paid to suppliers and employees		(597 295)	(637 964)	(597 139)	(644 365)
Cash generated from operating activities	A	72 365	33 115	70 658	34 318
Investment income received		14 663	23 839	13 097	23 327
Net cash inflow from operating activities		87 028	56 954	83 755	57 645
Cash flow from investing activities					
Property, plant and equipment acquired		(108 110)	(49 675)	(107 549)	(49 632)
Proceeds from the disposal of property, plant and equipment		1 134	1 642	1 402	1 641
Increase in net investment in subsidiaries		—	—	(2 496)	(90)
Net acquisition of long-term patents		(2 572)	(1 011)	—	—
Proceeds from the disposal of patents		—	3 572	—	—
Net cash outflow from investing activities		(109 548)	(45 472)	(108 643)	(48 081)
Cash flow from financing activities					
Increase/(decrease) in long-term loan		11 729	(54)	14 350	—
Net cash inflow/(outflow) from financing activities		11 729	(54)	(14 350)	—
Net (decrease)/increase in cash and cash equivalents		(10 791)	11 428	(10 538)	9 564
Cash and cash equivalents at beginning of the year		60 318	48 890	54 322	44 758
Cash and cash equivalents at end of the period		49 527	60 318	43 784	54 322



Note to the Cash Flow Statement

for the year ended 31 March 1999

	GROUP		CSIR	
	1999 R'000	1998 R'000	1999 R'000	1998 R'000
A. Reconciliation of net operating deficit for the year before investment income to cash generated from operations				
Net operating deficit for the year before investment income	(3 825)	(14 698)	(1 435)	(16 017)
Adjusted for:				
Depreciation	37 130	31 231	36 951	31 193
Loss on disposal of property, plant and equipment	4 570	1 357	4 570	1 355
Profit on disposal of patents	—	(3 316)	—	—
Investment in trade agreement written off	—	5 000	—	5 000
Technology advances written off	—	277	—	—
Unrealised gain on forward exchange contracts	(380)	—	(380)	—
Amortisation of technology licensing projects	858	648	—	—
Operating profit before changes in working capital	38 353	20 499	39 706	21 531
Decrease/(increase) in accounts receivable	14 479	(18 140)	14 536	(17 635)
(Increase)/decrease in inventory and contracts in progress	(10 268)	1 410	(9 943)	1 382
Increase/(decrease) in advances received	41 335	(2 449)	41 335	(2 241)
(Decrease)/increase in accounts payable and provisions	(11 534)	31 795	(14 976)	31 281
Net working capital changes	34 012	12 616	30 952	12 787
Cash generated from operations	72 365	33 115	70 658	34 318

1. Principal accounting policies

The annual financial statements are prepared on the historical cost basis, in accordance with generally accepted accounting practice and incorporate the following principal accounting policies, which have been consistently applied in all material respects, except for a change in accounting policy regarding foreign currency translations (see note 1.4).

1.1 Basis of consolidation

The annual consolidated financial statements incorporate the annual financial statements of the CSIR and its subsidiaries. The operating results of the subsidiaries are included from the effective dates of acquisition and up to the effective dates of disposal. All significant inter-company transactions and balances have been eliminated.

1.2 Associate companies

Associate companies are those companies in which the group has a significant influence and which it intends to hold as long-term investments. Associate companies are accounted for by the equity method from their most recently audited financial statements or unaudited management information as at 31 March 1999.

1.3 Research and development

Research costs are charged against income as and when incurred. Development costs of clearly defined products, of which the future technical feasibility and commercial viability has been proven to the satisfaction of the Board, are capitalised (refer note 1.5.3). The extent of capitalisation is limited to an amount equal to the present value of expected net future income.

1.4 Foreign currencies

1.4.1 Foreign entities

The financial statements of foreign subsidiaries are translated into South African rand as follows:

- Assets and liabilities at rates of exchange ruling at the reporting entities' financial year end.
- Income, expenditure and cash flow items at the average rates of exchange during the relevant financial year.

Differences arising on translation are reflected in non-distributable reserves in the foreign currency translation reserve.

1.4.2 Foreign currency transactions and balances

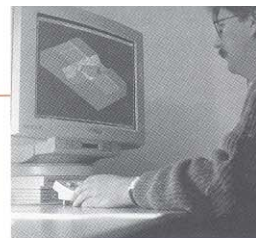
Transactions in foreign currencies are converted to South African rand at the rate of exchange ruling at the date of the transaction.

Monetary assets and liabilities denominated in foreign currencies are stated in South African rand using the rates of exchange ruling at the financial year end. The resulting exchange differences are dealt with in the income statement.

This is a change in accounting policy. Refer note 3.

1.4.3 Financial assets and liabilities

Gains and losses from forward exchange contracts are dealt with in the income statement. Fair values of financial instruments are included in assets and liabilities in the financial statements.



1. Principal accounting policies *(continued)*

1.5 Property, plant and equipment

1.5.1 Land and buildings

Land and buildings are stated at cost. Buildings are regarded as investment properties and are not depreciated, but provision is made for a permanent diminution in value. Provision for maintenance is charged against income.

1.5.2 Plant, equipment and vehicles

Plant, equipment and vehicles are stated at cost less accumulated depreciation.

1.5.3 Development expenditure and intellectual property

Development expenditure and intellectual property consist of capitalised development costs as approved by the Board. Capitalisation is limited to the present value of expected net future income (refer note 1.3).

1.5.4 Depreciation

Depreciation is based on cost and calculated on the straight line method at rates considered appropriate to write off book values over the estimated useful lives of the assets except for:

- Assets costing R2 000 or less, which are written off in the year of acquisition.
- Assets specifically acquired for a contract, which are depreciated over the life of the contract.
- Strategic assets of limited commercial application, which are written down to expected future commercial recoverable value at acquisition, with the remaining book value depreciated over the estimated useful lives of the assets.
- Development expenditure and intellectual property, which are depreciated over a maximum period of three years.

The estimated lives of the main categories of property, plant and equipment are as follows:

Plant	- 10 years
Equipment	- 5 - 10 years
Computer equipment	- 3 - 7 years
Vehicles	- 5 years
Development expenditure and intellectual property	- 3 years

The recorded value of these depreciated assets is periodically compared to the anticipated recoverable amount if the assets were to be sold. Where an asset's recorded value has declined below the recoverable amount, and the decline is expected to be of a permanent nature, the decline is recognised as an expense. To determine the recoverable amount, discounted future cash flows are considered.

1.6 Investments

Investments are stated at cost less amounts written off. Investments are written down where, in the opinion of the Board, a permanent diminution in value has occurred.

1. Principal accounting policies (continued)

1.7 Retirement benefits

1.7.1 Pension fund

The CSIR operates a defined contribution plan, the assets of which are held in a separate trustee-administered fund. The benefits payable by the fund in the future, due to retirements and withdrawals from the fund, are contributions by members to the fund together with fund interest at a rate determined by the valuator with the consent of the trustees. The rate is so determined that the value of the total liabilities of the fund shall not exceed the value of the total assets of the fund.

The CSIR's contributions to the plan are charged to the income statement when incurred.

1.7.2 Post-retirement benefits other than pensions

The CSIR formed an independent medical aid scheme on 1 April 1997. This fund has accepted responsibility for all future liabilities of members.

1.8 Turnover

Turnover comprises:

- The net invoiced value of research, development and implementation contracts excluding value added tax.
- Income acknowledged on contracts in progress as calculated per note 1.9.
- The annual Parliamentary Grant.
- Royalties.
- Consolidated turnover excludes sales to Group companies.

1.9 Inventory and contracts in progress

Raw materials and finished goods are stated at the lower end of cost and net realisable value. Cost of inventory is determined by the average method. Contracts in progress are stated at the lower end of cost and net realisable value. Net realisable value is calculated as a percentage of the sales value of work completed, after provision for losses relating to the stage of completion and any foreseeable losses to completion of the contract.

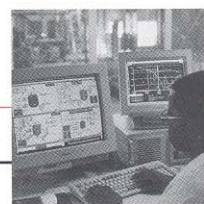
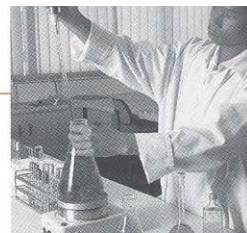
1.10 Deferred taxation

Deferred taxation is calculated on the comprehensive basis using the liability method. In terms of the comprehensive basis the tax effects of all timing differences are accounted for.

Where the tax effects of timing differences, including those arising from tax losses, give rise to a deferred tax asset, the asset is recognised only if it is probable that future taxable income will be sufficient to allow the tax benefit of the loss to be realised.

1.11 Comparative figures

Where necessary comparative figures have been reclassified to ensure comparability.



	GROUP				CSIR			
	1999		1998		1999		1998	
	R'000	%	R'000	%	R'000	%	R'000	%
2. Turnover								
Parliamentary Grant	325 469	47	336 255	49	325 469	47	336 255	49
Contract income	367 188	52	351 757	50	356 339	52	347 982	50
Private sector	194 832	28	177 357	26	183 983	27	173 582	25
Public sector	74 965	11	76 223	11	74 965	11	76 223	12
National Safety and Security sector	56 729	8	64 967	9	56 729	8	64 967	9
Other sectors (including Africa)	40 662	5	33 210	4	40 662	6	33 210	4
Royalties	4 126	1	3 563	1	4 126	1	3 563	1
Total turnover	696 783	100	691 575	100	685 934	100	687 800	100

	GROUP		CSIR	
	1999	1998	1999	1998
	R'000	R'000	R'000	R'000

3. Change in accounting policy

Foreign currency transactions	380	—	380	—
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During the year the CSIR changed its accounting policy for foreign currency transactions and balances. Transactions in foreign currency are now converted to South African rand at the rate of exchange ruling on the date of the transaction. Forward exchange contracts are valued at fair value at year end. This change was necessary to comply with generally accepted accounting practice.

In the past the CSIR converted foreign currency transactions at rates stipulated by forward exchange contracts. Unspecified forward exchange contracts were valued at spot rate at year end.

Results for the prior year and accumulated funds at the beginning of the prior year have not been restated as the effect would not be material and it was impractical to do so.

Notes to the Annual Financial Statements

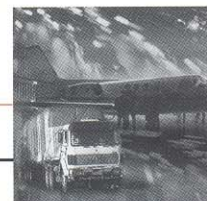
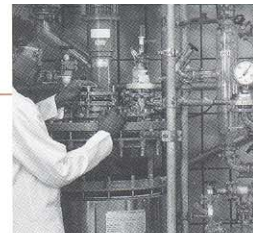
31 March 1999 (continued)

	GROUP		CSIR	
	1999 R'000	1998 R'000	1999 R'000	1998 R'000
4. Net operating deficit for the year before investment income				
The net operating deficit for the year before investment income is arrived at after taking the following items into account:				
Auditors' remuneration	1 141	921	1 001	846
Audit fees	1 092	867	952	798
Expenses	49	54	49	48
Exchange gains/(losses)	4 385	(120)	4 161	(120)
Fees paid for services	56 192	61 736	55 204	61 573
Patent costs	799	1 925	799	1 925
Legal costs	849	1 323	849	1 323
Consultants	54 544	58 488	53 566	58 325
Rentals paid for	7 493	5 562	7 038	5 562
Buildings	454	5 562	—	5 562
Equipment	7 039	—	7 038	—
Board members' emoluments				
For services on the Board	131	125	131	125
Abnormal item				
Investment in trade agreement written off	—	5 000	—	5 000
Amortisation of technology licensing projects	858	648	—	—

5. Interest in subsidiaries

Shares at cost	27 225	27 220
Indebtedness	(12 351)	(14 842)
– by subsidiaries	2 817	—
– to subsidiaries	(15 168)	(14 842)
Total	14 874	12 378

See Annexure A for details.



	Depreciation for the year R'000	1999			1998		
		Cost R'000	Accumulated depreciation R'000	Net book value R'000	Cost R'000	Accumulated depreciation R'000	Net book value R'000
6. Property, plant and equipment							
GROUP							
Land and buildings	—	157 753	—	157 753	136 106	—	136 106
Equipment	(36 681)	426 779	279 402	147 377	382 812	279 302	103 510
Vehicles	(449)	3 076	1 972	1 104	3 092	1 750	1 342
	(37 130)	587 608	281 374	306 234	522 010	281 052	240 958
CSIR							
Land and buildings	—	157 753	—	157 753	136 106	—	136 106
Equipment	(36 505)	425 570	278 910	146 660	382 354	278 987	103 367
Vehicles	(446)	2 997	1 969	1 028	3 092	1 750	1 342
	(36 951)	586 320	280 879	305 441	521 552	280 737	240 815

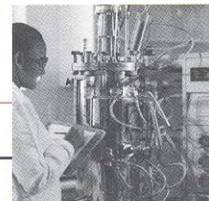
	1999			
	Net book value			
	Land and buildings R'000	Equipment R'000	Vehicles R'000	Total R'000
GROUP				
Opening balance	136 106	103 510	1 342	240 958
Additions	21 789	86 098	223	108 110
Disposals	(142)	(5 550)	(12)	(5 704)
Depreciation	—	(36 681)	(449)	(37 130)
	157 753	147 377	1 104	306 234
CSIR				
Opening balance	136 106	103 367	1 342	240 815
Additions	21 789	85 616	144	107 549
Disposals	(142)	(5 818)	(12)	(5 972)
Depreciation	—	(36 505)	(446)	(36 951)
	157 753	146 660	1 028	305 441

Land and buildings are unencumbered and full details of the titles are available at the registered office of the CSIR. Equipment with a net book value of R280 700 (1998: Rnil) is encumbered (see note 12).

Notes to the Annual Financial Statements

31 March 1999 (continued)

	GROUP		CSIR	
	1999 R'000	1998 R'000	1999 R'000	1998 R'000
7. Income from investments				
Interest	14 663	23 839	13 097	23 327
- Earned	14 674	23 839	13 097	23 327
- Paid	(11)	—	—	—
8. Investments				
Investments held by Technology Finance Corporation (Pty) Ltd	3 138	1 424	—	—
Deposits (funds on call)	30 000	30 000	30 000	30 000
	33 138	31 424	30 000	30 000
9. Accounts receivable				
Trade receivables	93 077	86 009	91 809	84 729
Prepaid expenditure	2 170	23 126	2 170	23 126
Forward exchange contracts	380	—	380	—
Other receivables	18 053	18 644	17 984	18 644
	113 680	127 779	112 343	126 499
10. Inventory and contracts in progress				
Inventory	5 179	6 065	4 784	5 995
Contracts in progress less provisions for losses	31 357	20 203	31 357	20 203
	36 536	26 268	36 141	26 198
11. Advances received				
Advances on contracts received from clients	48 777	7 442	48 777	7 442



	GROUP		CSIR	
	1999 R'000	1998 R'000	1999 R'000	1998 R'000
12. Long-term liabilities				
Unsecured				
IDC	4 160	7 059	—	—
<p>The interest-free loan is repayable annually commencing 30 June 1996 in amounts equal to 45% of the net royalty income and/or the net deemed royalty income from specified projects. The loan repayment will be terminated at the earlier of 30 November 2002 or the date upon which the payment exceeds the loan amount.</p>				
AECI				
The interest-free loan is repayable from 30 April 2000 as follows:				
30 April 2000 – R5 350 000	14 350	—	14 350	—
30 April 2001 – R5 000 000				
30 April 2002 – R4 000 000				
Secured				
Capitalised finance leases	278	—	—	—
Total leases	333	—	—	—
Less: Portion repayable within one year included in current liabilities	55	—	—	—
<p>The leases are repayable in monthly instalments at interest rates that vary between 21,05% and 21,62%. The last payment will take place in 2004.</p> <p>The current finance leases are secured over equipment with a net book value of R280 700 (1998: Rnil) (see note 6).</p>				
	18 788	7 059	14 350	—

13. Retirement benefits of employees

CSIR Pension Fund

The Fund is registered in terms of the Pension Funds Act, 1956 and is a defined contribution plan. The CSIR liability to the Fund is limited to paying the employer contributions. Life cover and dependants' pensions are fully secured by a continued income and life insurance policy.

Employer contributions of R22,9 million (1998: R20,1 million) and employee contributions of R13,8 million (1998: R12,2 million) were paid over during the year. Employer contributions are charged against income.

Mine Officials Pension Fund and Chamber of Mines Pension Fund

At the time of the merger with the Chamber of Mines Research Organisation in 1993, certain COMRO employees elected to remain members of the Mine Officials Pension Fund and Chamber of Mines Pension Fund. In terms of the agreement with the Chamber of Mines, this election holds no liability for the CSIR other than paying the monthly employee contributions.

In respect of the employees who have formally converted their secondment to a CSIR appointment, employer contributions of R353 921 (1998: R1,2 million) and employee contributions of R193 517 (1998: R493 000) were paid over during the year.

Associated Institutions Pension Fund and Temporary Employees Pension Fund

These Funds are defined benefit plans. The formula used to determine pensions is based on the pensionable earnings of the final year and the aggregate period of uninterrupted membership.

The CSIR has 18 (1998: 32) employees who are members of the AIPF and 4 (1998: 5) employees are members of the TEPF. Both funds are controlled by the State which has assumed responsibility for the unfunded portions of these Funds.

Employer contributions of R316 457 (1998: R462 003) and employee contributions of R115 237 (1998: R158 302) were paid over during the year to the AIPF and TEPF. Employer contributions are charged against income.

Post-retirement medical benefits

The CSIR formed its own medical aid scheme based on managed health care principles with a strong emphasis on co-responsibility between employer and employee; the objective is to provide sustainable health care and simultaneously limit the cost, present and future, to a level which is affordable.

The CSIR Board approved a cash resource of R190 million, the proceeds of which will substantially cover the actuarial valuation of the liability of R280 million. The actuarial valuation was carried out in January 1997.



14. Insurance and risk management

The insurance and risk management policies adopted by the CSIR are aimed at obtaining sufficient cover at the minimum cost to protect its asset base, earning capacity and legal obligations against unacceptable losses.

All fixed assets are insured at current replacement value. Risks of a possible catastrophic nature are identified and insured while acceptable risks of a non-catastrophic nature are self-insured. Self-insurance has been instituted where the cost-to-benefit relationship exceeds the risk and the incidence of losses is of a minor and infrequent nature. Self-insured risks are reviewed annually to ensure cover is adequate. An amount of R10 million (1998: R10 million) is held in a self-insurance fund to cover these risks. This amount is disclosed as part of accumulated funds in the balance sheet. No major losses were experienced during the year under review. Claims of a general nature were adequately covered.

	GROUP		CSIR	
	1999	1998	1999	1998
	R'000	R'000	R'000	R'000

15. Contingent liabilities

There are contingent liabilities in respect of

- Bank guarantees in respect of third party liabilities

	5 841	11 338	5 841	11 338
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16. Capital commitments

Authorised but not contracted

	—	20 500	—	20 500
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This capital expenditure is to be financed from internal sources.

17. Taxation

The CSIR and its subsidiary, the South African Inventions Development Corporation (SAIDCOR), are exempt from normal South African taxation. No provision for normal taxation is made as none of the other subsidiaries of the CSIR earned taxable income. These subsidiaries have calculated tax losses to set off against future taxable income.

Notes to the Annual Financial Statements

31 March 1999 (continued)

18. Financial instruments

18.1 Forward exchange contracts

The group enters into forward exchange contracts to buy specified amounts of foreign currencies in the future at a predetermined exchange rate.

Forward exchange contracts are entered into mainly to cover import orders. The group has no policy to enter into forward exchange contracts for anticipated foreign receipts.

The group does not use derivative financial instruments for speculative purposes.

Accounts receivable and accounts payable at 31 March 1999 include foreign trade receivables of R5 657 000 (1998: R8 222 000) and foreign trade payables of R1 583 000 (1998: R992 000). The full amounts of foreign trade payables for 1999 and 1998 were covered by forward exchange contracts at year end.

The following table summarises by major currency the amounts to the paid under forward contracts:

	GROUP		CSIR	
	1999 R'000	1998 R'000	1999 R'000	1998 R'000
US dollars				
3 - 6 months at rates averaging \$6,14	18 424	19 505	18 424	19 505
Swiss francs	1 098		1 098	
3 - 6 months at rates averaging CHF4,68	861	—	861	—
6 - 12 months at rates averaging CHF4,95	237	—	237	—
Dutch guilder				
3 - 6 months at rates averaging NLG3,51	42	106	42	106
	19 564	19 611	19 564	19 611

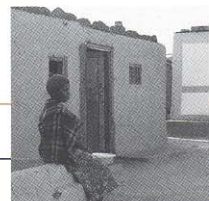
18.2 Credit risk

Financial assets that could subject the group to credit risk consist principally of cash at bank and cash equivalents, deposits and accounts receivable. The group's cash equivalents are placed with high credit quality financial institutions. Accounts receivable are presented net of the allowance for doubtful receivables. Credit risk with respect to trade receivables is limited due to the large number of customers comprising the group's customer base and their dispersion across different industries and geographical areas. Accordingly the group does not have significant concentration of credit risk. The carrying amounts of financial assets included in the balance sheet represent the group's exposure to credit risk in relation to these assets.

The group does not have any significant exposure to any individual customer or counter party.

18.3 Fair values

At 31 March 1999 the carrying amount of cash and cash equivalents, deposits, accounts receivable, accounts payable, contracts in progress, advances received and short-term borrowings approximated their fair values due to the short-term maturities of these assets and liabilities.



Annexure A: Investment in subsidiaries

31 March 1999

Consolidated subsidiaries	INTEREST OF THE CSIR												General nature of business	
	Issued capital R'000	Effective holding			Shares at cost		Net indebtedness				Net investment			
		1999 %	1998 %	Financial year-end	1999 R'000	1998 R'000	to subsidiaries		by subsidiaries		1999 R'000	1998 R'000		
Direct investments														
South African Inventions Development Corporation (SAIDCOR)	27 220	100	100	31 March	27 220	27 220	14 842	14 842	—	—	12 378	12 378		Investment in research development and implementation of technology.
Snowden Mining Consultants (Pty) Ltd*		100	—	31 March	—	—	326	—	785	—	459	—		International mining industry consulting organisation.
CSIR North America Inc**	5	100	—	31 March	5	—	—	—	2 032	—	2 037	—		Supports and consults to the pipeline industry.
					27 225	27 220	15 168	14 842	2 817	—	14 874	12 378		

* Issued capital R1 and shares at cost R1

** No statutory audit was performed

Indirect investments

Included in SAIDCOR:

Technology Finance Corporation (Pty) Limited (TECHNIFIN)*	5 200	100	100	31 March	4 400	4 400								The acquisition and transfer of technology to industry by licensing new inventions, providing finance to develop technology and venture capital for the exploitation thereof.
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Included in TECHNIFIN carrying value:

Quality Electronics Developments (Pty) Limited	1 000	76	76	30 June	—	—								Holder of intellectual property in electronic technologies. This subsidiary is not consolidated because the Board of the CSIR is of the opinion that it would be of no real value to the users of the annual financial statements in view of the insignificant amounts involved. The investment was written off during 1997.
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* The company changed its year end from 30 June to 31 March to coincide with that of its holding company. The results included in the current period cover the period 30 June 1997 - 31 March 1999.

The CSIR.
People with
vision,
partnerships
with **purpose,**
technology with
impact