

CSIR ANNUAL REPORT 1998



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Showcase green building . . .

The CSIR Conference Centre is one of the first buildings in South Africa to undergo an energy audit as part of the CSIR's Green Buildings for Africa programme, a national voluntary programme that has received widespread local and international endorsement. The programme encourages and assists commercial and industrial property owners to implement profitable, energy efficient improvements using proven technologies through which to reduce costs and minimise damage to the environment without compromising on indoor comfort and safety.

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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 THAT 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 **I**NTegrity

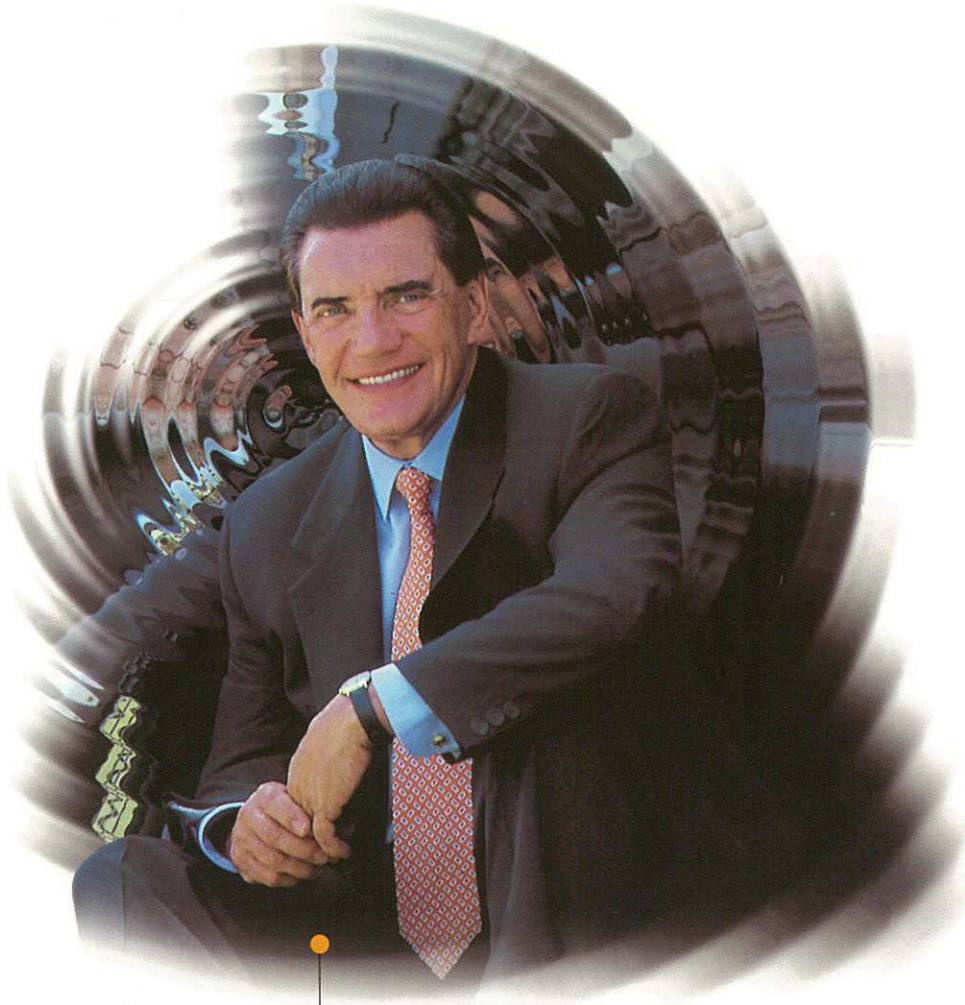
Crime mapping ...

A CSIR project in support of the National Crime Prevention Strategy analysed how operational information is used in police stations and developed optimal systems and procedures.



ESPRIT - the spirit of the CSIR

Chairman's Review



DR BILL VENTER
Executive Chairman
Allied Electronics
Corporation Limited

For the CSIR, the past year has represented a time of intense scrutiny, to the highest standards, by an independent Review Panel, of reformulation of its 5-year strategy. This has involved a process of deep reflection on the implications of changes – current and future – impacting our business environment and the social fabric of our country, and of ongoing operational performance across a range of indicators – financial, quality and service, organisational climate and transformation, and, most importantly, delivery on commitments in serving the needs of our country.

All in all, the Board of the CSIR is well pleased with an organisation which has rightly been described as “one of the major assets of the South African system of Innovation”.

Under the microscope

In an increasingly competitive environment, locally and internationally, the comprehensive Science Councils' Review process carried out during this past year – initiated and led by the Department of Arts, Culture, Science and Technology – was timeous. I deem it appropriate to profile this Review in my report this year, particularly as it pertains to the CSIR, primarily because of the insight it provides, independently and internationally benchmarked, in three key domains of good governance, namely ensuring capable leadership, sound strategy, and effective and efficient management and controls.

Thus for the Board it was gratifying, though not surprising, that the CSIR was described by the Review Panel in its report as “an effective organisation which is enthusiastically and vigorously attempting to meet the demands of the new policy climate in South Africa”.

In regard to the manner in which the CSIR is led and managed, the integrated System Wide Review team concluded that the CSIR demonstrated “outstanding management skills, exemplified by their world-class system for the analysis, and distribution and content of financial resources and (an) exemplary human

resource development programme (with) a real commitment to transformation. Its leadership is considered to be mission-focused, visionary, dedicated, energetic, of high technical ability and people-oriented", a view which the CSIR Board strongly endorses.

During 1997, a formal process of strategic review was undertaken by the CSIR, itself recognising – in the very fluid environment in which the CSIR operates at home and abroad – that revisiting the CSIR's strategy in relation to emerging opportunities and challenges and refining this, in a dynamic way, is essential to ensuring our continued contribution to the attainment of national objectives.

As such, it was again gratifying that the CSIR Review Panel formally acknowledged that many of its recommendations and suggestions are incorporated in CSIR 2002, the CSIR's Strategic Plan for the next five years, reflecting that "in reaching its conclusions independently, this convergence is encouraging and strengthens our confidence in the CSIR Management".

Through the comprehensive process of detailed external review a number of valuable suggestions and recommendations were developed by the Review

Panel, which are addressed in detail for implementation in the CSIR's 1998/99 Business Plan. In particular the Panel has challenged the organisation to further stimulate the rate and extent of innovation, revitalise the focus on scientific and technical excellence, develop further its network of international alliances, and review commercial/commercialisation policies and practices to optimise technology transfer, technological impact and discretionary financial returns.

Innovation to the fore?

The CSIR's vision for South Africa's transition to the 21st century necessarily links it to the establishment of a healthy and just society within the framework of a growing economy.

As such, an increased focus on enhancing innovation is particularly relevant and urgent, both for the CSIR as an organisation and for South Africa as a nation.

It is becoming increasingly clear that globalisation and technological innovation are the two major forces driving our world into the next millennium. We are fully cognisant of the fact that, as an organisation in a developing country, we must ensure that we have a solid knowledge

CSIR Board Members

MR LES BOYD
Deputy Chairman
Anglo American Corporation
of South Africa Limited



PROF ANTON EBERHARD
Head
Energy for Development
Research Centre
University of Cape Town



DR DHIRO GIHWALA
Director
School of Science
Peninsula Technikon



MS ANNE LETSEBE
Chief Director, Social Sector
Coordination and
Implementation Unit
Office of the Deputy State
President



MR KHAYA NGQUILA
Chief Executive Officer
Industrial Development
Corporation of South Africa
Limited

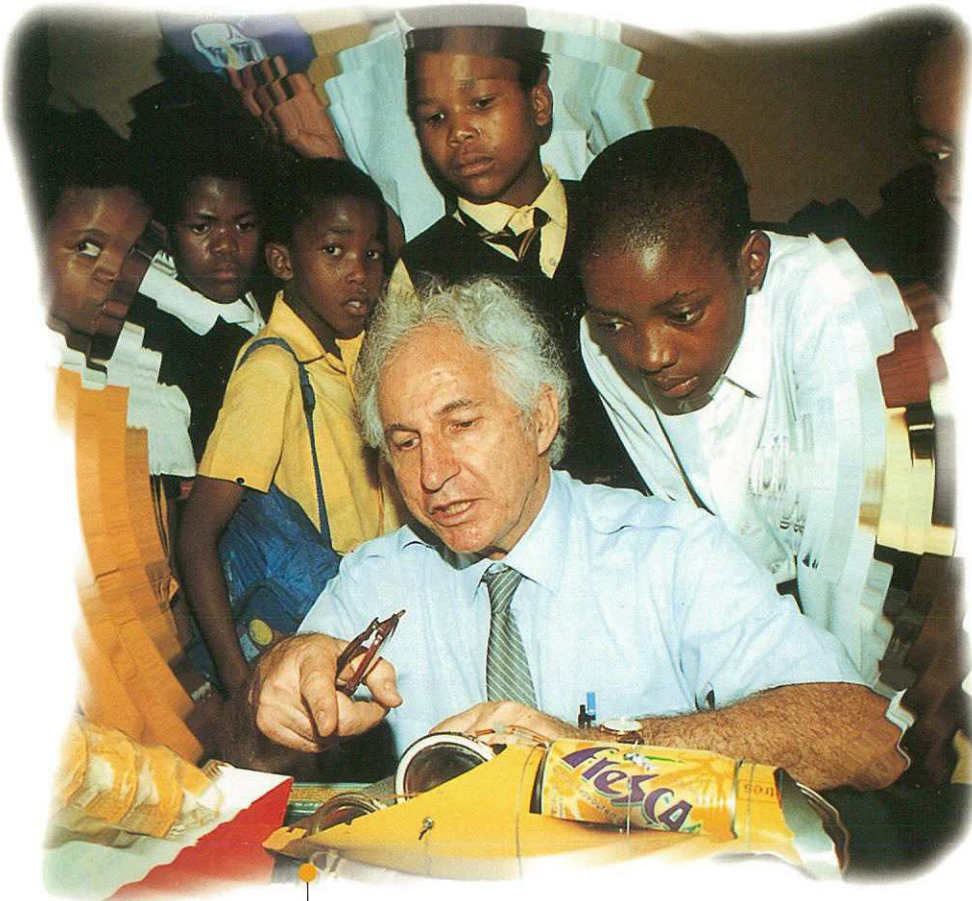


MR KHOMOTSO PHIHLELA
Managing Director
Tolcon (Pty) Ltd



Chairman's Review

(continued)



Creativity without boundaries . . .

1998 has been designated by the Government as the Year of Science and Technology, to raise the level of public awareness of the benefit of science, engineering and technology in helping to create growth and prosperity for all. In contribution to the launch of the Year, the CSIR held a Science, Technology and Arts Festival to demonstrate the innovation, creativity and value of science and technology.

base to fulfil our potential. Above all, however, innovation will be the lifeblood and driving force of our organisation in the way that we do business and in the solutions that we provide to our customers.

At a national level, however, I am concerned that innovation has yet to be viewed as a priority by all. It surely is a key driver underpinning economic growth and societal development. I would appeal to Government to address this issue as a matter of urgency. With technology and innovation as a low priority, many highly innovative South African achievers can be attracted to other countries offering more dynamic business and personal opportunities.

A Year of Science and Technology

The CSIR welcomed the Government's bold initiative in declaring 1998 the Year of Science and Technology, and enthusiastically aligned itself with the main objectives of generating public interest and raising the profile of science, engineering and technology in everyday life.

We are committed to an extensive programme of supporting activities, which was launched with a science, technology and arts festival at the CSIR site in Pretoria during the launch week for the year in February.

I sincerely believe that the Government's Year of Science and Technology will add immense value to spreading the message, especially among the previously disadvantaged and disempowered, that the application of science and technology are life-enriching and relevant to the future growth of our country.

The activities of this important year will undoubtedly re-emphasise the value of technological innovation as an all-important driving force of sustainable economic development in our country.

The future from here

International economic studies have suggested that between 40 percent and 90 percent of a nation's economic growth relies on technological advances, improved knowledge and research. It is also well known that technological innovation is a well spring of job creation. All of us at the CSIR are dedicated to this concept, in all that we do. South Africa badly needs its scientists, engineers and innovators and everything possible must be done to encourage them and their advancement. Science and technology must rapidly become part of the South African culture.

I am extremely proud of the CSIR's portfolio of business units and cluster of core competencies which are currently well positioned to respond to future technological trends as well as economic and developmental opportunities and challenges.

Convergence, integration and systemic technology management will continue to be the major drivers of our organisational success. I believe that the CSIR has a vitally important role to play in the transformation of South Africa, and has the competence and will to grow as an organisation

that addresses the complexity of many of the critical challenges of the years which lie ahead.

The Parliamentary Grant remains a critical resource that has to be even more effectively leveraged. We need to continue to demonstrate efficient and effective stewardship, sound governance and response to our governing Acts. Most of all, we need to ensure wise investment to develop and secure the future capacity and competences critical to our ongoing contribution to meeting the challenge of our nation's priorities.

The present platforms that the CSIR have from which to deliver value to clients and stakeholders are in good condition. However, the changing nature of knowledge services globally suggests that we cannot afford to become complacent. With appropriate support from Government and continued sound management and innovation, the CSIR can continue to contribute significantly to the economic well-being of our country.

In summary, and referring back to the CSIR Review, the Panel concluded – rightly, in my view – that the challenge ahead is now "to turn a very good organisation into a great one".



CONVERGENCE,
INTEGRATION AND
SYSTEMIC TECHNOLOGY
MANAGEMENT WILL
CONTINUE TO BE MAJOR
DRIVERS OF OUR
ORGANISATIONAL SUCCESS.

CSIR Board Members

PROF FRIEDEL SELLSCHOP
*Schonland Professorial Research
Fellow and Professor Emeritus
Schonland Research Centre
for Nuclear Sciences and
Department of Physics
University of the Witwatersrand*



MS LYNDALL SHOPE-MAFOLE
*Adviser to the Minister for
Communications*



MR EUGÈNE VAN AS
*Executive Chairman
Sappi Limited*



Chairman's Review

(continued)



*Mining made safer . . .
The most modern and high-technology breathing simulator to measure the functioning of Self-Contained Self Rescuers has been commissioned by the CSIR and is the only facility in the southern hemisphere capable of providing a performance monitoring service of this nature that is up to international standards.*

In conclusion

It is an honour and privilege for me to chair the CSIR Board. As such I wish to laud the substantial, honest and insightful contributions of my fellow Board members. It behoves me to thank them most sincerely for their significant and visionary support and assistance during the period under review. We also continue to be grateful to our many valued clients, and of course suppliers, for their unstinting support. The interest and encouragement of our stakeholders are acknowledged and appreciated.

Finally, my sincere thanks and appreciation go to each and every man and woman at the CSIR who has strived for excellence and who has contributed so meaningfully towards their organisation's and the nation's well-being.

Through continued employee commitment, and dedication, through efficient business practices and through innovation, the CSIR will remain South Africa's key strategic science and technology asset, respected both locally and internationally for the highest standards of performance.

I'm not only proud, but also enriched, to be part of this winning team.

Dr W P Venter
Chairman

10 June 1998

Highlighting some achievements

Outstanding achievers 1997

Innovation permeates the CSIR's operating culture and highlights the unique abilities of our people to find sophisticated yet appropriate solutions to improving quality of life for everyone. Our outstanding achievers demonstrate the committed contribution of our people in action in their quest to deliver high-quality, value-added products and services to our clients and stakeholders.



The CSIR Learning Centre Team: Philip Masemola (back), Peter Moagi and Mpume Rampbomane (Corporate) – in recognition of their invaluable contribution to employee development and to helping to make the CSIR a people-centred organisation.



The Investment Portfolio Tool Team: Ela Romanowska, HOFFIE Hofmeyr, Ilse de Villiers, Rens Scheepers and Michael Groenewald (inserts) – for the development of a tool to capture and grow the process by which the CSIR manages its Parliamentary Grant at all levels.



The Satellite Tracking and Support Group: Piet van der Westhuizen, Tasso Karantonis, Pierre Picard, Raoul Hodges and Michelle le Saux – for their leadership role in making the Satellite Applications Centre an internationally renowned ground station for launch support in the Southern Hemisphere.



The Housing Management Systems Team: Gustav Coetzee, Dries du Toit, Mauritz de Beer, Louis Waldeck for their contribution to housing delivery in South Africa, and more particularly for the design, development and implementation of the Housing Subsidy System for administering the Government's housing subsidy scheme.

DR ALEX WEAVER (Environmentek)
 For his leadership role in the critically important area of integration within his division, across the CSIR and externally and for pioneering the establishment of the Environmental Impact Assessment process in the CSIR, South Africa and internationally.



BRIAN ARMSTRONG (Aerrotek)
 For playing a leading role in securing several multi-million contracts and as a CSIR role model who ably demonstrates the organisation's core values of technical excellence, team spirit and business acumen.



DR REINIE BIESENBACH (Strategic Market Development Group)
 For his efforts in promoting the CSIR internationally and his support of CSIR divisions in their global positioning strategy.



DR NICOLAAS JANSE VAN RENSBURG (Textek)
 For his sustained research leadership as a nationally and internationally recognised expert in the field of textile chemistry, and more recently for his outstanding and innovative work in the field of waterproof, breathable membranes.



PHIL HENDRICKS (Transportek)
 For improving the financial success and strategic direction of his programme and for securing large contracts through exceptional marketing skills. Also in recognition of his successful leadership and mentorship of young professionals and his contribution towards the development of southern Africa.



Highlighting some achievements

(continued)

Some contract highlights

Our wide range of contracts and services are profiled in *Technology Impact*, the companion document to this report. Following is a selection of highlights:

- Development of a gauge and acceleration monitoring device to assist in preventing shaft down-time in gold mining operations.
- Development of technologies for aero-elasticity and flight mechanics for in store carriage and release predictions.
- Independent technical audit of a road section in Botswana as well as deflectograph surveys.
- Provision of support in policy formulation in the fields of transport, energy, environment, science and technology and public understanding of science and technology.
- Provision of wide-ranging technical support services to the National Crime Prevention Strategy through a network of alliances and partnerships, including GIS-based spatial representations of crime statistics to aid interpretations; assisting the SAPS in the gathering, management and analysis of crime-related data; developing best practice guidelines to improve planning and design of safer cities; and developing forensic science information management systems.
- Establishment of the first wild silk harvesting and early processing pilot project involving local communities.
- Provision of specialist consultancy services to assist with the development and capacity building for the Umtata Teaching Hospital.
- Monitoring winter water conditions for the forestry industry.
- Developing and commissioning an air quality monitoring network in Uruguay for sulphur dioxide and particulates and for acid rain, including the provision of relevant training in air quality.
- Development of a state-of-the-art secure router firewall system which provides controlled connectivity between a business's network and the Internet.
- Partner in a European Union funded project to investigate enhancing the stability of dried whole capelin, a fish found in the Atlantic and North Pacific.
- Production of high precision ceramic components of high complexity and dimensional repeatability for the manufacturing industry.
- Environmental assessment to determine the design criteria for a new effluent pipeline that discharges into the sea at Mombasa.
- Development of decision support tools for co-ordinated investment in location planning.
- A feasibility study to develop a library service distribution centre.
- Artificial recharging of ground water to increase the amount of ground water available for exploitation.

Newly launched

- Incubator for Empowerment and Job Creation – this facility aims to help develop small, medium and micro enterprises (SMMEs) which would typically be based on technologies developed by the CSIR's divisions and implemented in a way that empowers entrepreneurs from previously disadvantaged communities.
- Entrepreneurial Support Centre – the Centre was launched in the North West Province to support both prospective and existing SMMEs in the area of technical extension, training, technology demonstration, administration and mentorship services, as well as access to high-level technologies.
- Manufacturing Advisory Centres (MACs) – the CSIR, in partnership with Ntsika Enterprise Promotions Agency and the National Productivity Institute, launched a MAC pilot programme to assist SMME manufacturers to upgrade their performance and competitiveness in both the local and international markets.

Developing SMMEs . . .

The incubator for empowerment and job creation assists in empowering entrepreneurs.



Manufacturing advice . . .

Hands on assistance to textile SMMEs is offered at the Manufacturing Advisory Centre in Port Elizabeth (PERMAC).



Local government . . .

A team at the CSIR has developed a methodology to assist local governments in formulating their Integrated Development Plans.





The 1997 J D Roberts Award – Louis Waldek and Kosie Smith of Boutek received the award for their outstanding, world-class contribution to the development of standards processing technology.



Technology Top 100 Awards – Dr Petro Terblanche, Foodtek and Dr Neville Comins, Mattek. The two divisions were joint winners of the Technology Top 100 Research and Development Award for 1997.



The CSIR's Apprentice Training Centre received full accreditation for the training of turner/machinists from the Metal and Engineering Industries Education and Training Board (MEIETB).

A selection of awards

- A Special Gold Award for Equity in the Workplace was awarded to Foodtek by the Business and Professional Women – South Africa Federation.

- SABS Design Institute award – Bennie Langenhoven, Gawie de Vos and Greg Randall, won an award in the category "Pre-production Prototypes" for the design of the HMO CC-3E Electronic Magnetic Compass.

- Top Products Award 1997 – MineRisk, a Miningtek product that assesses and manages the risks in the mining industry associated with inter alia, equipment design, operational procedures and project constraints, won a Top Product Award in recognition of its significant contribution to the South African economy as a commercially viable innovation.

- Masimanyane Awards – the CSIR sponsored the Masimanyane awards, jointly organised by Engineering Week and the Engineering Association to give recognition to innovation through people-driven programmes that have succeeded in creating integrated and sustainable products, processes, projects and services to create greater wealth, peace and security for all South Africans. As part of its sponsorship, the CSIR presented one of the qualifiers with a special CSIR Technology Innovation Award.

- Golden Loerie – the CSIR corporate video was awarded a Golden Loerie and a craft award for script, performance, camera and lighting and direction at the 1997 South African Loerie Awards, presented by the Association of Marketers, and aimed at recognising creativity and excellence in advertising.

- Raw-chem Expo 98 – Mattek won a Gold Category Award for its stand at the Expo, demonstrating innovative solutions with minimal environmental impact. Criteria included stand design, professionalism of stand manners in terms of attitude and knowledge of products and services on display and the quality of enquiry-capturing mechanisms and information and literature available.

*Top Products Award . . .
Pulane Mogoere of Miningtek receiving the award on behalf of her division.*



*Challenging young minds . . .
Congratulations to all the 1997 CSIR Mindwalk competition winners for their innovative and creative entries.*



Visitors

- More than 150 000 people visited the CSIR site in Pretoria during the year. The profile of the visitors ranged from scholars to Cabinet Ministers and Portfolio Committee members and included the 33rd National Science Week winners. In addition the CSIR hosted delegations from a number of countries including the USA, Germany, Sweden, Korea and Angola.

President's Review



DR GEOFF GARRETT

The year under review has been a dynamic and demanding one for the CSIR. Against a background of turbulence in the science and technology sector, we were faced with tough business conditions and the ever-present risks and challenges associated with life in our rapidly changing society. Despite this, we believe that we have continued to set high standards in the quest for quality delivery and, in so doing, have enhanced our reputation as a competitive, relevant and efficient organisation.

What we are all about

The CSIR is driven by a single goal: to serve our nation and its people. We do this in the way we know best, by developing and sourcing knowledge and technology and putting it into everyday practice to solve the problems that affect us all. In short, the CSIR is about providing Creative Solutions and Information that are Relevant.

Our challenge, as embodied in our vision and mission statements, is a formidable one. On the one hand, we need to put science and technology to work in the service of a better society. On the other, we need to spur economic growth. It is crucial that we balance these interests in a way that best meets the needs of our organisation and the world in which we operate.

The next five years – our 2002 strategy

At home and abroad, the CSIR finds itself operating in environments that are constantly subject to change. Because of this, we must regularly ask ourselves whether we are going in the right direction, at the right pace, and for the right reasons.

With this in mind, the CSIR Board, at its meeting in June 1997, was presented with and approved, our five-year strategy, CSIR 2002. In essence, this strategy seeks to address the scientific, technological and societal forces that will shape the years ahead and define our response to these. This allows us to make adjustments, re-assess our priorities, and do all we can today to build the CSIR of tomorrow.

In developing our strategy, and as a framework for it, we formulated a set of 10-year scenarios, taking into account prevailing uncertainties of our changing environment – both locally and globally – over the next decade. The focal issue we have sought to address is:

"How will the business of providing knowledge-intensive services be characterised in 2007, in terms of strategic architecture, core processes, markets and values?"

We firmly believe that our vision, mission and values will serve as a robust foundation for building a challenging and rewarding future.

Our strategy planning process helped us to identify certain "course adjustments", critical for the longer term. These incorporate five focused, linked strategic initiatives:

- effecting organisational (re) design for the CSIR into the next century;
- supporting national human resource development in science and technology, in the context of the National System of Innovation;
- harnessing the power of information and communications technology;
- enhancing internal alignment and external positioning, facilitated by superior communication; and
- leveraging the investment of our Parliamentary Grant through more relevant financial models.

We strive for continuous improvement in operational effectiveness. These initiatives are underpinned by our values and the ongoing development of our people. We believe that these initiatives, linked to enhanced innovation and supporting our twin goals of growth and transformation, will provide appropriate and meaningful adjustments to our course as we journey in support of building South

Africa to winning nation status, meeting the hopes and aspirations of all our citizens.

Progressing "from very good to great" – the CSIR review

Taking a cue from the 1996 White Paper on Science and Technology, the latter part of 1997 saw a thorough investigation into the strategies, structure and operations of government-funded science, engineering and technology institutions. The key question was: how can such institutions best meet the interests of our changing society? The CSIR wholeheartedly supported this review process, and will do all in its power to help find the answers.

Enthusiastically attempting to meet national needs

As indicated by the CSIR chairman in his review, a distinguished nine-member Review Panel, selected from local and international communities and appointed by the Department of Arts, Culture, Science and Technology (DACST), visited us during November 1997. They documented their findings and recommendations in a comprehensive report. In his review, the CSIR chairman has summarised the Panel's key observations and recommendations. The Panel believes that with "appropriate support from government and continued good management, the CSIR can progress from a very good organisation to a great one, with world-class technical competencies, and contribute significantly to the nation's economic well-being."



WE SERVE OUR NATION AND ITS PEOPLE IN THE WAY WE KNOW BEST, BY DEVELOPING AND SOURCING KNOWLEDGE AND TECHNOLOGY, AND PUTTING IT INTO PRACTICE TO SOLVE PROBLEMS THAT AFFECT US ALL.

Clearing landmines . . .

The CSIR's landmine detection system, which uses multiple sensors and data fusion technologies, is achieving remarkable results in landmine detection tests.



Satellite image mosaics . . .

Space Maps are precision geo-corrected satellite image mosaics. The CSIR has started producing 1:50 000 scale Space Maps of the main metropolitan areas in South Africa.



President's Review

(continued)



Meeting manufacturing needs . . .

The manufacturing industry is in need of precision ceramic components of high complexity and dimensional repeatability. The CSIR has developed a processing capability for materials such as alumina compositions, zirconia oxide and zirconia toughened alumina bodies. A porcelain body used for electrical application can also be processed, as well as battery seals with an internal thread that is formed into a component in one step.

In examining our core competencies, the Review Panel highlighted those "that define the CSIR's capability to perform its mission. They are:

- a broad knowledge base in materials, manufacturing and information technology, and skillful application of these foundation technologies to solve diverse problems;
- an innovative and efficient approach to managing its research portfolio;
- a management team that is dedicated in principle and practice to human resource development, focusing on technical professionals."

In describing the organisation, the Review Panel "characterised the evident attributes of the CSIR as compassion, innovation and passion. Compassion requires that the institution (continues to) react with sensitivity and empathy to the needs of individuals and communities in the broad society. Innovation implying an institutional capability and culture that fosters creativity and the generation of new ideas (that with) passion . . . (through) the commitment and dedication required of innovators . . . (are) translated into products,

processes and services that (when implemented), contribute to economic and social development."

While the report praised the CSIR for its diverse technical strengths, management skills and commitment, emphasis was also placed on the need for enhanced innovative thinking and new technology acquisition (for example in advanced manufacturing and biotechnology) in the quest to build a better society. We have been challenged to continue to seek solutions that will help promote social change, develop our people, enhance our global competitiveness, and preserve and protect the natural environment.

Working to support national imperatives

In partnership with our clients and stakeholders, the CSIR seeks to serve South Africa and its people by providing technology solutions and information that are relevant to our society. Against the framework of a coherent and articulate national policy for science and technology, we are proud to play a leading role in promoting competitiveness and job creation, enhancing quality of life, and developing human and technical resources in a way that respects the integrity of the natural environment, while at the same time, harnessing the power of the information revolution that is upon us.

We have, over the past year, enjoyed significant involvement in each of these areas.

Some of our wide range of activities are briefly mentioned here, and more fully illustrated in *Technology Impact*, the companion document to this report.

Competitiveness and employment creation – going to work on being the best

The CSIR is mindful that the needs and expectations of every South African cannot be met without a national economic revival.

In addition to ongoing programmes in support of this goal, specific achievements in 1997/98 have included the establishment of a South African Manufacturing Excellence Centre (MEC) to better harness the diverse capabilities of the CSIR and other South African and international organisations, and academic institutions, with the aim of improving the global competitiveness of South Africa's manufacturing industry (see also page 17 of this report).

We have also been involved in the spatial development thrust with the Department of Transport and have supported the Department of Trade and Industry with their industrial strategy initiatives. In addition, closer links have been developed with the Small Business Centre, Ntsika Enterprise Promotions Agency and other role players in the small enterprise sector.

Models of business excellence

Excellence may be an over-worked term in the world of business today, but it remains integral to achieving success

and progress. We were actively involved in the development of the South African Business Excellence Model, and in the launch of the South African Business Excellence Foundation during August 1997. For the first time, there is now a coherent, systemic approach to assessing organisations along the lines of the European Quality Foundation and the Malcolm Baldrige Model in the United States.

Quality of life – making life cleaner, healthier, more secure
Every free society strives to build a better quality of life for its citizens. We are proud to play our part in meeting this goal.

Our divisions are actively involved in such basic areas as housing, water and sanitation and helping to provide a safe environment. Through primary health care and the efficient utilisation of energy in urban and rural areas, we are putting technology to work in the service of a safer, cleaner and healthier South Africa.

Specific examples include our participation in a consortium of Science Councils undertaking research to combat crime, our involvement in Business Against Crime and the provision of extensive technical support to improve working conditions and decrease risk in the mining environment.

We recognise the sustainable development arena as an enormous business opportunity. While we are increasingly operating more effectively in this relatively new domain, we

Housing guide . . .
The CSIR's Housing and Information System (HUIS) enables the housing fraternity to have national, management information.



Faster and better . . .
Training courses are being offered to mines in the effective use of Environ 2.5, a popular computer program developed to simulate mine ventilation and cooling systems.



Focus on sisal . . .
The CSIR is driving an initiative to establish a competitive natural fibre industry in South Africa.



President's Review

(continued)



Better gravel roads . . .

The implementation of labour-based construction techniques creates opportunities and assists with the development of small contractors whilst upgrading the transportation network. The Field Gravel Road Test Kit, developed in conjunction with the International Labour Organisation (ILO), is used to evaluate borrow materials for use as wearing course on unsealed roads and to ensure that the quality of the construction is appropriate.

must engage in projects which, besides being relevant, are designed to nurture a market and optimise our learning and positioning therein. In addition, we must fulfil our role as researcher and developer of relevant technology packages, while relying on specialist external partners to replicate and amplify the work throughout all the constituencies of the development arena.

Developing human potential

No society can hope to achieve its goals if its people are not empowered to achieve. In the science and technology sector, we are contributing to the upliftment and development of people in a variety of ways.

Promising students at tertiary educational institutions are provided with first-hand exposure to client projects. Our Division of Mining Technology has adopted the Vulcanindlela Secondary School in the Orange Farm squatter community to help provide some role models to the students and stimulate their

interest in science, engineering and technology. We continued our programme of school visits to the CSIR to facilitate and enhance the understanding of science and technology at the secondary education level, while in the Western Cape we launched an educators' empowerment project for science teachers.

We intend to establish ourselves as an initiator of a number of such human resource development projects, such as our Mindwalk science and technology competition (see also page 22 of this report) which, once established, can be transferred to sponsors and other role players.

Caring for our environment

In the quest to strike a working balance between the needs of man and the integrity of the natural environment, the CSIR has been putting many innovative ideas into practice. These ranged from more efficient water use in the forestry industry to improved management of waste disposal and pollution in the marine environment and more accurate assessments of the risk of air pollution.

Along with the University of Cape Town, we have received international recognition for our role in drawing up guidelines for an Integrated Environmental Management (IEM) procedure. In addition, we have played a major role in a number of world-class Environmental Impact Assessments undertaken in South Africa, such as for the SFF

Association to investigate a proposed expansion of the crude oil transfer operations at Saldanha Bay and for the Coega Industrial Development Zone Initiative to assess the conditions under which the proposed Coega development initiative and harbour could be allowed to proceed.

Promoting the Information Society – a critical element in economic and community growth

We believe strongly that the people of South Africa should enjoy equal access to information. With this in mind, we are committed to using information technology to support education and social development. Some of our initiatives include low-cost, high-speed wireless systems, education centres in remote areas, and information kiosks at taxi ranks, shopping malls and spaza shops.

During the year under review we also participated in a Cabinet Investment Cluster (CIC) task team with the Departments of Trade and Industry, Constitutional Development and Arts, Culture, Science and Technology as well as Investment South Africa, in developing a conceptual information system that will provide investment opportunities within departments and provinces for the CIC. A demonstration of the concept was shared with and endorsed by the Intergovernmental Forum in August 1997. An information set has also been compiled that documents

about 80 existing and potential information and communications technology related projects between the CSIR and government. We will use this as a tool to better serve and coordinate our initiatives with government in this field.

Our progress in the world around us

The CSIR is moving towards earning 60% of its turnover from non-Parliamentary Grant sources. Achieving sustainable real growth in our external contract income, at acceptable levels of sustainable performance, continues to be a critical requirement. Similarly, maintaining an appropriate level of Parliamentary Grant for investment in capacity and competence development will be essential.

The challenge is for each of our nine operating divisions to pursue an aggressive strategy of growth in existing and new markets.

Expansion into the provinces

Over the next few years, the CSIR will have transformed from a Gauteng-centred organisation with some provincial offices, into a fully representative organisation with a strong market-related presence in all nine provinces.

Since the CSIR's provincialisation strategy was approved in December 1996, our increased provincial activities have led to 26,9% of our income coming from outside Gauteng in 1997/98 (19,2% in 1996/97). We have developed an investment model for



WE BELIEVE THAT THE PEOPLE OF SOUTH AFRICA SHOULD ENJOY EQUAL ACCESS TO INFORMATION. WITH THIS IN MIND WE ARE COMMITTED TO USING INFORMATION TECHNOLOGY TO SUPPORT EDUCATION AND SOCIAL DEVELOPMENT.

Textile training . . .

The CSIR participates in textile education at a tertiary level, while also offering vocational skills training programmes in hand-weaving, spinning, dyeing, fabric finishing, product design, sewing and machine knitting.



Community network . . .

Proven invaluable in distance education, the wide bandwidth of the Community Information Delivery System allows exchange of multimedia information.



President's Review

(continued)



Improving measurement capability . . .

The CSIR's National Metrology Laboratory (NML) celebrated its 50th anniversary during 1997. Throughout its long history, the NML has provided the means for industry to improve its measurement capability to the limits imposed by modern technology and instrumentation. The NML is the custodian of South Africa's national measuring standards.

provincialisation, implemented a provincial structure, created much greater awareness of provincialisation in the CSIR and established additional offices outside Gauteng. We are confident that this process will improve the CSIR's ability to assist with employment creation and help spur development in the provinces.

Delivering a body-blow to crime

As part of the science and technology sector's fight against crime, the past financial year saw the completion of the first year of a co-ordinated CSIR response to the National Crime Prevention Strategy (NCPS). This forms the basis for a long term involvement in crime prevention by the CSIR. Some 30 projects have been undertaken, many in co-operation with the relevant Criminal Justice System structures, the NCPS, Business Against Crime and other Science Councils. Funding in the order of R12 million has been attracted.

Specific examples include the investigation of approaches to marking vehicles and vehicle parts and formulating guidelines for a unified vehicle database. We also explored and piloted a number of information technology-based projects for use by the South African Police Service and developed information and communication approaches for community-based crime prevention initiatives.

These initiatives have been underpinned by the development of a Crime Prevention Technology Clearing House which has created linkages to local and international sources of information and expertise.

Helping to make the country attractive to visitors

The tourism sector offers tempting opportunities for economic growth, not only for South Africa but for the region as a whole. Our tourism initiative includes the provision of information and decision support technologies, such as database development, environmental impact assessments (EIAs), and support to small, medium and micro enterprises (SMMEs) with a tourism bent.

Playing the game in the sports arena

Sport is integral to the South African way of life, and the CSIR takes pride in being an active player. Our multi-divisional sports initiative has made exceptional progress. A number of databases and

websites have been developed on behalf of the Sports Information and Science Agency (SISA), a body constituted by the Department of Sport and Recreation, the National Olympic Committee of South Africa and the National Sports Council. These databases are designed to provide the necessary infrastructure for decision-making, and to make information available to all concerned.

In addition, we provided support to the South African Football Association and Bafana Bafana during the All Africa Cup of Nations in Burkina Faso. This took the form of notational analysis, a games analysis technology which provides information on the strategies and style of play.

Making things to world standards

With South Africa once again an active participant in the global economy, we have been engaged in a number of initiatives to help establish a more competitive manufacturing sector. During 1997, we developed a strategy to help provide a comprehensive support base for the growth of manufacturing in South Africa.

One outcome has been the creation of the CSIR's Manufacturing Excellence Centre (MEC), a joint initiative of three CSIR divisions, namely Manufacturing and Aeronautical Systems Technology, Materials Science and Technology and Information and Communications Technology. The distinctive

features of this support-base are world-class resources, strategic alliances with international research and development agencies, a network into local and international manufacturing operations and a strategic insight into the economic and technological imperatives that will help the South African economy to grow.

To ensure that the MECs offerings also meet the needs of the local manufacturing industry, a Make It Southern African Manufacturing Club has been launched. This will be run by the industry for the industry, with administrative assistance from the CSIR.

In addition, the MEC has facilitated a task group for the automotive industry as part of the Motor Industry Development Programme (MIDP) mid-term review. This workshop, attended by a large number of industry leaders, was most successful as it put the emphasis on the role of technology, in its broadest sense, in building a world-class industry in South Africa.

Reaching out to the region

The CSIR's strategy to position itself as a provider of key technical assistance to SADC has gained further momentum during the period under review. This involves technology transfer to the region, increased contract sales and shared learning. Representation at the SADC Industrial Research and Development Workshop in Harare is proving useful in building our SADC research and development networks.



OUR STRATEGY TO POSITION THE CSIR AS A PROVIDER OF KEY TECHNICAL ASSISTANCE TO SADC HAS GAINED MOMENTUM. THIS INVOLVES TECHNOLOGY TRANSFER TO THE REGION, INCREASED CONTRACT SALES AND SHARED LEARNING.

Management plan . . .

An aerial view of the Groot Brak estuary where the CSIR devised a monitoring programme to measure the impact of the Wolwedans Dam.



Accurate assessment . . .

A system that can detect poisonous gases up to 10km away has been developed by the CSIR.



President's Review

(continued)



Cyber medicine . . .

The CSIR has released quarterly upgrades of its Virus Protection System over the past year. Anti-virus researchers have added various enhancements to the system, including a macro anti-virus feature, which combats the rapidly growing number of macro viruses that are found in programs on a personal computer. Research has also been conducted into making the system Local Area Network (LAN)-aware, making upgrading of virus protection software automatically from the network a simple matter for network managers.

We were also represented at the SADC World Economic Forum and will contribute to the World Economic Forum SADC Summit in Namibia on the role of technology in SADC's development and competitiveness.

As an example, the CSIR's National Metrology Laboratory is participating in a SADC task group to develop a Memorandum of Understanding between SADC member states on Standardisation, Quality Assurance and Metrology (SQAM). The draft protocol will be presented to SADC Heads of State during 1998.

Taking our place in Africa

The World Association of Industrial and Technological Research Organisations (WAITRO) recently demonstrated its faith in the CSIR by appointing us as its Regional Focal Point (RFP) for Africa. With 121 members in 70 countries worldwide, WAITRO has grassroots contact with domestic industry and policy-making bodies. We are currently establishing links and accreditation for other African research and technology organisations.

We are working with 17 African countries on projects ranging from the provision of decision support systems for offshore diamond exploration in Sierra Leone to undertaking water quality monitoring, treatment and resource surveys in Botswana, Kenya and Lesotho and forest inventories in Angola, Botswana, Congo and Mozambique, as well as assisting Ghana with safety in gold mines, doing a housing study in Congo and transferring sorghum beer brewing technology in Zambia.

Reaching out to the world

The year under review has been particularly eventful for the CSIR in the international arena.

Our foreign income has grown to 9,5% of our external income (1996/97: 8,6%) and significant strides have been taken in cementing some key international alliances, especially in the USA, Germany, India, Sweden, Finland and Denmark.

We participated in and contributed to the work of the science and technology committees of the Binational Commissions between South Africa and the United States and Germany, as well as in several official delegations to foreign countries.

We also worked closely with the Department of Arts, Culture, Science and Technology (DACST) on several international initiatives including accompanying Minister Lionel Mtshali on his official visit to Finland and Denmark in April 1997.

Making technology more accessible

The CSIR's small, medium and micro enterprises (SMME) drive has a two-pronged approach, based on specific initiatives and an integrative thrust. The integrative thrust deals with the establishment of manufacturing advisory centres (MACs) to support the manufacturing needs of SMMEs, technology demonstration centres (TDCs) and the rural development of SMMEs.

The TDCs seek to provide a bridge between technology and education, making technology more accessible and giving students the opportunity to develop practical skills in technology. This is a joint venture between the CSIR and the Departments of Trade and Industry (DTI) and Arts, Culture, Science and Technology (DACST), as well as educational institutions and foreign donors.

We have also supported the DTI's drive to provide information to SMMEs. As a member of a consortium led by Decision Technologies, we have helped to develop and implement the national information system for small business. The first walk-in/call centre has been launched at the Greater Pretoria Metropolitan Council.

In addition, we have co-operated with the National Union of Mine Workers' Development Agency to develop a strategy, implementation plan and financial model for the sustainable implementation of national development centres.

A partnership to accelerate development

In co-operation with the Lubisi Dam Development Forum (LDDF), representing 23 villages in the Eastern Cape, we have formed a partnership to examine how technology can be used to accelerate development.

Five CSIR divisions are working with the LDDF to investigate the best way of introducing hydro-electric, wind and biogas power (see also page 40 of this report).

Our people

The CSIR would be incapable of achieving any of its goals without the support and skills of its people. Our vision acknowledges the crucial role our people have to play in helping to build a people-centred organisation based on our values of excellence, service, relevance, innovation and integrity.

Because of this, we will again be placing strong emphasis on further developing our human resource systems and practices in the coming financial year.

Education and training are critical to such initiatives, and this will be receiving a sharply enhanced focus in the years ahead. We are also in the final planning stages of the establishment of an Innovation Leadership Academy, aimed at strengthening our ability to compete and win in the boundaryless world of science and technology.



OUR VISION
ACKNOWLEDGES THE
CRUCIAL ROLE OUR PEOPLE
PLAY IN HELPING TO BUILD
A PEOPLE-CENTRED
ORGANISATION BASED
ON OUR VALUES OF
EXCELLENCE, SERVICE,
PEOPLE, RELEVANCE,
INNOVATION AND
INTEGRITY.

Self-sufficiency . . .

The CSIR is assisting the community near Lubisi Dam in the Eastern Cape with a range of projects including the cultivation of cotton.



Safe drinking water . . .

Twenty rural communities in the Western Cape now have safe drinking water thanks to the CSIR's Cape Water Programme.



President's Review

(continued)



*"Waste" silk into spun yarn . . .
A development by the CSIR for
converting "waste" silk into spun
yarn and other spun-silk products
has created a number of job
opportunities for local residents
and unskilled people in southern
Africa.*

Transformation for innovation

Innovation and the development of core competencies are key pillars that inform our transformation process. The transformation structures put in place over the past two years are maturing and gaining credibility. With the support of line management, the transformation model has become the blueprint for our transformation initiatives. Among other things, it has helped to allay white male fears of being excluded from a place in achieving the CSIR's goals and vision. The key challenge during 1998 will be to ensure that current legislation on Labour Relations and Employment Equity is entrenched within these structures.

Working better by working together

In order to create awareness and promote understanding of the new Recognition Agreement, we joined forces with NEHAWU to hold a workshop for our human resources practitioners. Reaction at all levels was very positive.

Guided by the provisions of the new Basic Conditions of Employment Act, we have been looking closely at the CSIR's Conditions of Service. We have already taken positive steps towards bridging any gaps and bringing our employment practices in line with the requirements of the Act. Working forums have been set up to encourage discussion and address concerns across the organisation. We are also seeking new and better ways of involving the union in these matters.

As we move towards finalising a new agreement between the CSIR and NEHAWU, we will be allocating resources to make it easier for union members to take part in meetings and training. By sharing ideas and working together, we can meet the complex challenges facing our organisation in this domain.

Managing our investment in science and technology

Looking ahead

In line with the CSIR's Foresight process, initiated in 1997, all divisions have defined the drivers of social and economic change that will shape their sectors and industries in the next 20 years. These drivers have been used to identify technologies that could be produced or adapted to suit South Africa's needs in 2020. The process is supported by the CSIR Policy Group, with a view to establishing Foresight as a key management tool in the CSIR.

Understanding and adapting to change

The CSIR, whose own Foresight process runs concurrent with the national Foresight programme, is represented on most of the national Foresight sector panels, either as co-ordinator or participant. The resulting cross-fertilisation has been of benefit. The national Foresight programme will provide further information that will enhance the process of understanding and adapting to change.

In partnership with tertiary education

As part of our initiative to build working partnerships in the National System of Innovation, 10 leading local academics have accepted invitations to become CSIR Associates. This gives them a formal role as our partners in furthering technical excellence and conducting contract research for local industry.

We will continue to nurture our mutually beneficial relationships with the Technikons and "historically black" universities, many of which have benefited by working with larger established groups at the CSIR, while contributing unique expertise or access to local research material.

Some other initiatives

Investing in important technological domains

During the course of the year the CSIR undertook a number of proactive investments in

important technological domains. Among these was the creation of a platform for molecular simulation with advanced software in our Division of Materials Science and Technology, linked to the University of the North.

A competitive natural fibre industry in South Africa to utilise and commercially exploit the country's very large variety of natural fibres is being developed in a consortium with major companies.

A large 55 m-long scale model of the proposed new deep water harbour at Coega, north of Port Elizabeth, is being built at the CSIR in Stellenbosch to study wave action on the breakwaters and test the feasibility of breakwater designs and possible harbour layout.

New competencies have also been created in a number of thrusts, including risk assessment, food security, small mining, construction technology and a number of GIS-based decision support platforms in the transport environment.

A different slant on reality

Proving that virtual reality has stepped beyond the bounds of science-fiction, the CSIR has joined forces with Prosolvia (1997 company of the year in Sweden) to set up South Africa's first comprehensive market-oriented Virtual Reality Centre. The technology has practical applications for the building and construction, transport and logistics, defence and manufacturing sectors. It can



THE CSIR SEEKS TO SHARE KNOWLEDGE AND EXPERIENCE BY HARNESSING SCARCE SCIENTIFIC AND RESEARCH RESOURCES TO ENSURE MAXIMUM BENEFITS IN THE TRANSFER OF KNOWLEDGE, SKILLS AND TECHNOLOGY.

Saving money and time . . .

Super Hoist has been specially designed to cope with major derailments of vehicles underground in mines.



Proposed harbour . . .

About 25 000 dolosse and core loc units were used in the scale model of the proposed Coega Harbour breakwater constructed at the CSIR's model facility in Stellenbosch.



President's Review

(continued)



Virtual reality . . .

The CSIR and Prosovia of Sweden have established a Virtual Reality Competence Centre (VRC) at the CSIR in Pretoria. The VRC will contribute to the development of local industry and education through the implementation of virtual reality technologies with local industry partners.

also be used to address pressing environmental issues. The centre will be opened during the next financial year.

Manufacturing advisory centres

The first two pilot Manufacturing Advisory Centres (MACs) in Port Elizabeth and Durban, which opened their doors in early 1998, have already begun to play a positive role in serving and advising small enterprise communities.

We see great opportunity for development in this arena, and have begun looking at the feasibility of setting up MACs in other parts of South Africa. There is also scope for the provision of extension office services in regions with a lower manufacturing presence.

Endorsing the Year of Science and Technology

As part of our broader role in the society we serve, the CSIR takes pride in sharing the aims and vision of

the Year of Science and Technology declared by Cabinet for 1998.

Our activities have included participation in a Science Councils' exhibit at all the provincial events, a science, technology and arts festival held at our Pretoria site, and the design of an inter-Science Council Information Society event for presentation at three provincial focus weeks. We also seconded a project manager to assist DACST with the development and implementation of management systems for the year. A number of additional activities are planned for the period after March 1998, culminating in our participation in the Gauteng focus week in November 1998.

Taking young minds for a walk through the world of science and technology

Launched as a pilot project in the Gauteng area in 1996 to promote greater technological awareness among the youth of South Africa, the CSIR's Mindwalk science and technology competition has proved to be a resounding success.

In 1997, almost 250 schools took part in the competition, which was then extended to include entrants from Pretoria, Johannesburg, Durban, Port Elizabeth and Cape Town. Thanks to a continued positive response, the programme for 1998 has been extended to include Bloemfontein.

The way ahead

The CSIR operates in a fast-changing environment, locally and globally. With insight and vision, we will be equipped to meet the challenges of tomorrow. The nature of our business demands that we anticipate the scientific and technological forces that will shape the years ahead. We must do so in a way that enhances our competitive strengths, while fulfilling our statutory obligation of acquiring and transferring technology.

Building on our track record of service delivery, we enter the new financial year with a firm commitment to enhancing innovation, scientific and technological excellence, learning and career development, and social and organisational change, as we set out to expand our business and build new alliances at home and abroad.

In this way, we can play a greater part than ever in helping transform South Africa into a winning nation and making a real and enduring difference in the lives of all its peoples.

Acknowledgement and grateful thanks

The CSIR is privileged to have a body of employees who are passionate about their work and committed to the organisation they work for. It is a rewarding experience working with them and watching their achievements,

and I thank them for their dedication and effort and for showing how much the CSIR is capable of achieving. My appreciation also goes to their families whose support makes these achievements possible.

I would like to express my special gratitude to the CSIR Executive and division directors for their key role in helping to bring the past financial year to a successful conclusion. A special word of great appreciation also to our Board members, who always add value and provide constructive input. It has been both a privilege and a valuable experience to work with them. In particular, I wish to thank our Chairman, Dr Bill Venter, who, despite the busiest of lives, always makes time to challenge and advise.

Finally, I would like to thank all our business partners and stakeholders for their continued support and assure them that we will continue, in a spirit of true partnership, to address their needs through creative and quality technology solutions well into the future.



Dr Geoff Garrett
President



THE NATURE OF OUR
BUSINESS DEMANDS THAT
WE ANTICIPATE THE
SCIENTIFIC AND
TECHNOLOGICAL FORCES
THAT WILL SHAPE THE
YEARS AHEAD.

Stimulating creativity . . .
The CSIR's Mindwalk competition has been extended to include six major metropolitan areas: Pretoria, Johannesburg, Durban, Port Elizabeth, Cape Town and Bloemfontein.



Fun in science . . .
Part of celebrating the Year of Science and Technology is teaching children that science is fun.



Annual Financial Statements

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Report by the Auditor-General

on the Annual Financial Statements of the CSIR for the year ended 31 March 1998

1. Audit assignment

The group annual financial statements of the CSIR, set out on pages 24 to 64, have been audited in terms of Section 188 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), read with Section 14(1) of the Scientific Research Council Act, 1988 (Act No. 46 of 1988). These annual financial statements; maintenance of effective control measures and the compliance with relevant laws and regulations are the responsibility of the President of the CSIR. My responsibility is to express an opinion on these annual financial statements and the compliance with relevant laws and regulations based on the audit.

2. Regularity audit

2.1 Nature and scope

Financial audit

The audit was conducted in accordance with generally accepted government auditing standards. These standards require the audit to be planned and performed so as to obtain reasonable assurance that the financial statements are free of 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 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.

Compliance audit

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

2.2 Audit opinion

Financial audit

In my opinion, the consolidated financial statements fairly present, in all material respects, the financial position of the CSIR and the group at 31 March 1998 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 Reporting by Public Entities Act, 1992, is fair in all significant respects and, where applicable, on a basis consistent with that of the preceding year.

Compliance audit

In my opinion:

- the transactions of the CSIR that came to my notice in the course of my examination were made in accordance with the applicable laws and instructions; and
- the transactions that came to my attention during auditing were in all material aspects in accordance with the mandatory functions of

the CSIR as determined by law or otherwise.

3. Subsidiaries excluded from annual financial statements

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

4. Year 2000 compliance of computer systems

Without qualifying my opinion above, attention is drawn to the fact that addressing the Year 2000 compliance issue is the responsibility of the President of the CSIR.

Notwithstanding the actions that are taken to address the effect of the Year 2000 issue, a full integrated systems test has not yet been performed to confirm the adequacy of these actions. I did not perform any procedures to test whether the CSIR's system or any other related systems are Year 2000 compliant. Accordingly, I do not express any opinion or provide any other assurances regarding the Year 2000 compliance of computer systems in operation at the CSIR.

5. Appreciation

The courtesy extended and assistance rendered by the CSIR's personnel during the audit is greatly appreciated.



H van Zyl
for Auditor-General

Pretoria
26 June 1998

Executive Report



Providing decision support . . .

The CSIR's Development Management Services group provide decision support for development planning and monitoring at national and provincial level.

Introduction

This report provides information about the performance of the CSIR as required in terms of the Reporting by Public Entities Act, Act 93 of 1992, as amended.

The CSIR Board, who fulfil the role of directors as envisaged by the Companies Act, Act 61 of 1973, have pleasure in submitting to Parliament, through the Minister of Trade and Industry, this report and the audited financial statements for the year ended 31 March 1998. The annual report is tabled with its companion document, *Technology Impact*. In the opinion of the CSIR Board, the financial statements fairly reflect the financial position of the CSIR as at 31 March 1998 and the results of its operations for the period under review.

Acts and legislation

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

Mandate

The CSIR's Act records its 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".

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 and the Reporting by Public Entities Act, where appropriate.

Financial policies

The annual financial statements are prepared on the historical cost basis, in accordance with generally accepted accounting practice and the principal

accounting policies are set out on pages 52 and 53 of this report.

Corporate governance

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.

Governing bodies

The CSIR, through a separate supervisory and management board structure, has three distinct structures governing its affairs. These are the CSIR Board, the Executive Board and the Management Board.

The CSIR Board approves the mission, strategy, goals, operating policies and priorities for the organisation, while the Executive Board has executive responsibility for the CSIR. The Management Board is responsible for strategy implementation and managing the day to day affairs of the CSIR and its divisions in accordance with the policies and objectives approved by the CSIR Board. The three governing structures have a collective responsibility to provide effective corporate governance.

CSIR Board

President

Executive

FINANCE AND MARKETING	HUMAN RESOURCES	TECHNOLOGY FOR DEVELOPMENT	TECHNOLOGY AND POLICY
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Operating divisions

CSIR Board

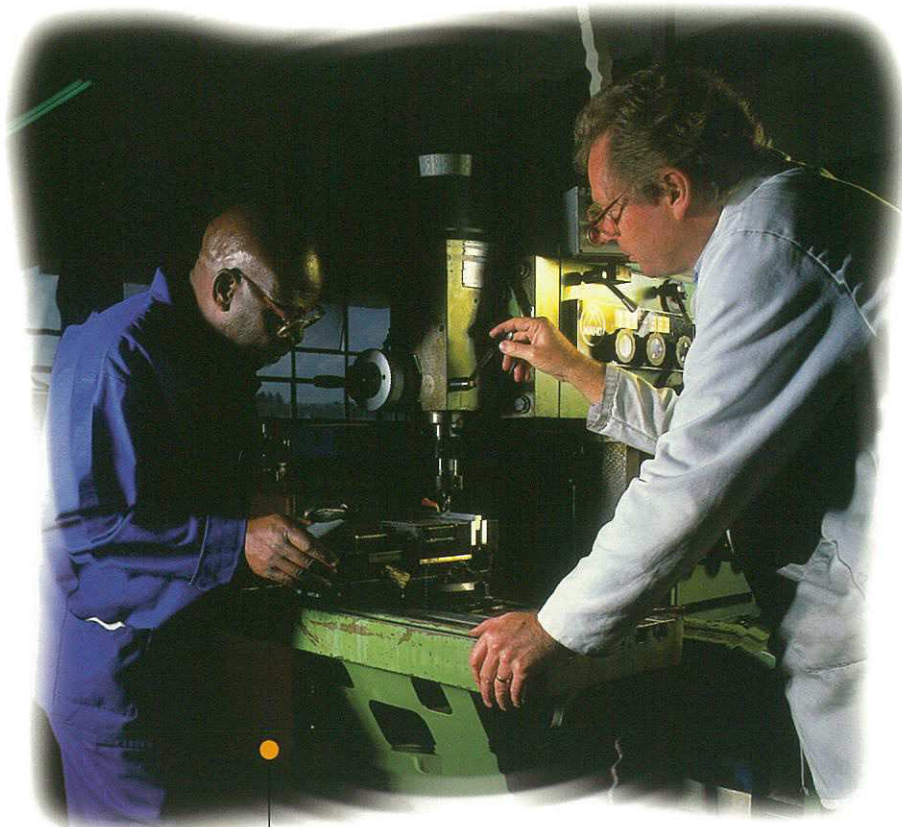
CSIR Board members are appointed for a term of three years by the Minister of Trade and Industry. With the exception of the President of the CSIR, all the members of the CSIR Board are non-executive. All CSIR Board members are actively involved in, and bring independent judgement to bear, on Board deliberations and decisions. This Board meets every quarter and monitors organisational performance against pre-defined objectives and plans described in the CSIR's 12-month business plans, including, *inter alia*, financial performance, quality and customer service, organisational climate and transformation.

The CSIR Board has the following committees: the Human Resources and



Executive Report

(continued)



Enlarging skills pool . . .

The CSIR is committed to fulfilling its responsibility to contribute towards increasing the skills pool in science, technology and engineering. Staff members are trained at Adult Basic Education and Apprentice Training Centres and inservice training and internship opportunities are offered to students studying for diplomas and degrees.

Remuneration Committee, the Audit Committee and the Science and Technology Committee. These committees are comprised of members of the Board and are attended by the President and/or a Vice-President ex officio.

During the year under review the CSIR Board met on 11 June, 29 August, 14 November 1997 and 27 February 1998. A special Board meeting was held on 21 January 1998 to discuss the CSIR report resulting from a Science Councils' review process conducted in terms of a recommendation in the White Paper on Science and Technology. This report was submitted to the Department of Arts, Culture, Science and Technology by the international panel responsible for the review. More information is provided in respect of this review elsewhere in this annual report.

Board members during the 12 month period reported on were: Dr Bill Venter (Chairman), Dr Dhiro Gihwala, Professor Anton Eberhard, Professor Friedel Sellschop, Ms Lyndall Shope-Mafole, Mr Les Boyd, Mr Khomotso Phihlela, Mr Eugène van As, Mr Khaya Ngqula (appointed 1/8/97) and Ms Anne Letsebe (appointed 1/1/98).

The current number of Board members meets the statutory minimum requirement.

Executive Board

The Executive Board consists of the CSIR President (who acts as Chairman) and the four Executive Vice-Presidents. For the 1997/98 financial year the CSIR Executive consisted of Dr Geoff Garrett, President; Mr Neo Moikangoa, Executive Vice-President: Technology for Development; Mr Albert Jordaan, Executive Vice-President: Finance and Marketing; Dr Adi Paterson, Executive Vice-President: Technology and Policy; and Dr Namane Magau, Executive Vice-President: Human Resources. The Executive Board meets regularly once a week.

Management Board

The Management Board comprises the members of

the Executive Board, chaired by the President, and the nine division directors. For the 1997/98 financial year, the division directors (profiled in *Technology Impact*) were Mr Johann Ahlers, Mr David Bath, Dr Neville Comins, Mrs Tina Eboka, Dr Güner Gürtunca, Mr Gaby Magomola, Dr Hoffman Maree, Dr Petro Terblanche and Mr Anthos Yannakou.

Mrs Tina Eboka joined the CSIR as director of the Division of Textile Technology in September 1997, upon the resignation of Mr Jan Becker and Mr David Bath (previously corporate business development manager) assumed directorship of the Division of Information and Communications Technology in an acting capacity. The Management Board meets once a month.

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

Audit Committee

The audit committee is integral to the CSIR's system of controls. The committee has a mandate which clearly sets out the scope of its work

and its objectives. The audit committee deals with all matters prescribed by the Reporting by Public Entities Act and its regulations. The members for the 1997/98 financial year comprised Mr Eugène van As (Chairman), Mr Les Boyd, Dr Dhiro Gihwala, Mr Khomotso Phihlela, Dr Geoff Garrett and Mr Albert Jordaan (ex officio). The committee meets twice during the financial year and these meetings took place on 3 June and 27 November 1997.

Human Resources and Remuneration Committee

The human resources committee provides the vehicle for the CSIR Board to influence and control human resources and remuneration in the organisation. The committee meets twice during the year to discuss and determine human resources policy and strategy and to approve remuneration changes and bonus payments. In 1997 these meetings took place on 28 May and 21 August. The members of the committee were Dr Bill Venter (Chairman), Prof Anton Eberhard, Mr Khomotso Phihlela, Ms Lyndall Shope-Mafole, Dr Geoff Garrett and Dr Namane Magau (ex officio).

MR ALBERT JORDAAN
*Executive Vice-President:
Finance and Marketing*



DR NAMANE MAGAU
*Executive Vice-President:
Human Resources*



MR NEO MOIKANGOA
*Executive Vice-President:
Policy and Technology for
Development*



DR ADI PATERSON
*Executive Vice-President:
Technology and Chief
Information Officer*



Executive Report

(continued)



Ensuring a healthy environment . . .

Using decision support tools for natural resource strategic planning and management.

Science and Technology Committee

The science and technology committee of the CSIR Board was established during the financial year under review. Its purpose is to provide guidance and advice on the long-term direction and selection of the CSIR's science and technology portfolio, in the context of the needs of the country; to ensure that key innovations and research processes are conducted effectively and efficiently and benchmarked with international best practice, and that research outputs, organisational climate and credibility remain congruent with the role and objectives of the institution.

The first committee comprised Prof Friedel Sellschop (Chairman), Prof Anton Eberhard, Dr Dhiro Gihwala, Dr Geoff Garrett and Dr Adi Paterson (ex officio).

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 auditing standards.

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 an adequate and efficient audit review of the proper functioning of these key controls and it is the audit committee's responsibility to determine the scope and review and approve the annual audit plan and work of the CSIR corporate auditors.

The CSIR Board sets policy from time to time and has

adopted an "approval framework" which governs the authorisation processes in the CSIR. Appropriate controls exist to ensure compliance with the approval framework. A comprehensive set of procedures exists in the organisation, designed to provide the necessary checks and balances for the economic, efficient and effective use of resources.

Self-assessments have been conducted in all CSIR divisions on a pilot basis using the United States' Malcolm Baldrige National Quality Award process (developed by the American National Institute for Standards and Technology) as a means of providing a "balanced scorecard" assessment of the total operations of the CSIR's divisions (discussed in more detail on page 36).

Management of the CSIR

During 1997 a panel comprising local and international members, recognised for their individual excellence in science and technology management, conducted a review of the CSIR as part of a wider review of South Africa's Science Councils. The report on the CSIR review was submitted to the Department of Arts, Culture, Science and Tech-

nology on 1 December 1997. Their findings on internal control were reported in the following statements¹:

"The Panel finds the management of the CSIR to be excellent . . . the management team is mission-oriented, dedicated and well informed and provides a supportive working environment . . . the financial systems controls are in place, and probably surpass those found in some private sector companies. . . . One shortcoming in this system is that it locks research into financial accountability by time spent, which can detract from research impact . . ."

In addition the report referred to the fact that: *"Information for formulating goals, and data for administering CSIR operations, comes from an in-house developed system of integrated management and finance tools that addresses every facet of business including client identification and development, marketing, project planning and tracking, personnel data, financial management, organisational structure and performance tracking to goals."*

The Panel put forward 13 recommendations for improvement, which were appropriately incorporated in the integrating System-Wide Review Report completed at the end of February 1998. On 7 April 1998, the CSIR



WE REMAIN CHALLENGED TO CONTINUOUSLY IMPROVE ON STAKEHOLDER SATISFACTION AND CUSTOMER PERCEPTIONS – A CRITICAL DOMAIN OF ORGANISATION PERFORMANCE.

Radar technology . . .

The CSIR has established a world class competency in radar signal processing technology, which is applied in radars used for surveillance, weapon fire control and air traffic control.



Arrive Alive . . .

The calibration of breathalysers for use in the Department of Transport's Arrive Alive campaign was done by the CSIR's National Metrology Laboratory.



¹ Review of the CSIR: Report to the Department of Arts, Culture, Science and Technology, 1 December 1997

Executive Report

(continued)



Odourless solutions . . .

The CSIR is engaged in creating a sensory and analytical capability to identify and solve taint and off-odour problems in foods, beverages and packaging and to develop flavour quality control protocols so that problems can be prevented. A wide range of problems can be addressed in addition to special expertise in analytical method development which can be applied to particularly challenging problems.

Management Board submitted a detailed response to both CSIR specific and the more general recommendations and proposals made in the report to the Department of Arts, Culture, Science and Technology, also outlining plans to address the recommendations.

Employee participation

The CSIR strongly encourages democratic workplace practices and relationships to foster an organisational climate of participation and involvement for all its employees. Participative structures such as divisional and corporate transformation action groups have been established to involve employee representatives in the business of the CSIR. Employees participate on an ongoing basis in the development of business plans and in normal management and leadership

communication. Employee satisfaction is currently measured on a bi-annual basis and the results are used to effect improvements and take corrective action as necessary.

Charter of Ethics

The CSIR Board and Executive Board have approved and adopted a Charter of Ethics which 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.

This links closely to the CSIR's set of organisational values, as described earlier in this report.

Environment, Health and Safety (EHS)

Unannounced and announced EHS audits were conducted and counted 40% and 60% respectively towards the final EHS audit result. The aggregate for individual ratings by divisions during 1997 was 89% (1996/97: 86,1%). The trophy for best performance for the 1997 audits went to the Division of Textile Technology in the high risk category.

Best performance in the medium risk category went to

the Division of Food Science and Technology and in the low risk category to Computing Services. The CSIR retained its 4-star grading during the internal CSIR EHS audit, while five of the divisions achieved a 5-star standard. The Disabling Injury Frequency Rate for 1997 was 3,9 against a target of less than 5.

The CSIR has embarked on the implementation of the ISO 14001 international standard that specifies the requirements for an effective environmental management system. The Internal Services group has been the first to apply for certification against this standard and will be audited by the South African Bureau of Standards in the new financial year.

General

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

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.

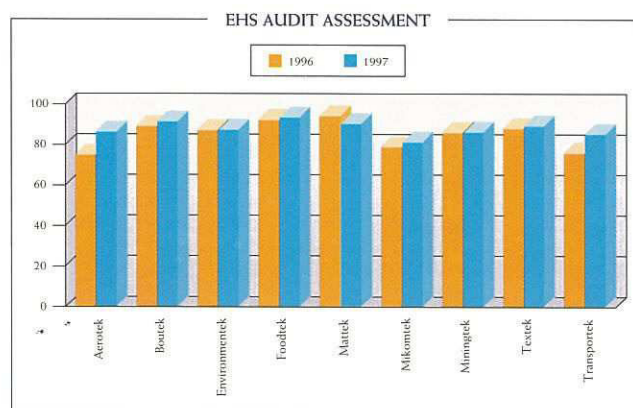
Function and objectives

Nature of our business

The CSIR provides technology solutions and information to support sustainable development and economic growth in the context of national priorities. We strive to be the best in technology, leadership and partnering and, through our people, to fight poverty, build global competitiveness and make an enduring difference in the lives of all South Africans.

The focus of the CSIR's

Parliamentary Grant investment remains centred around the key national imperatives, as defined by the White Paper on Science and Technology, namely: competitiveness and employment creation, improved quality of life, human resource development, environmental sustainability and promotion of an information society. These imperatives provide the macro-strategic framework within which the CSIR's business plan and business goals are constructed.



Executive Report

(continued)



Best of the best . . .

The CSIR's rockburst investigation team provides the South African mining industry with a highly specialised investigative aid to better understand the causes of seismic events and related distribution of damage. Investigations have produced the most detailed rockburst reports available to the industry and have often identified the actual cause of the event.

Business goals

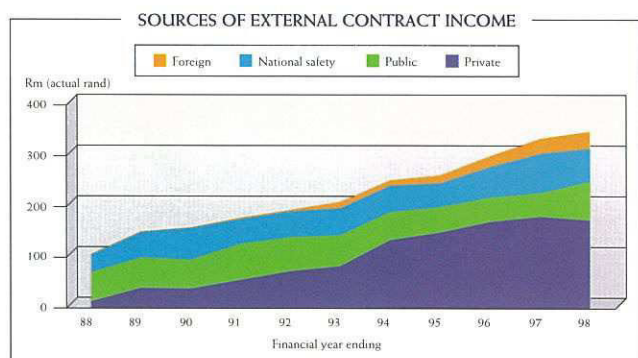
The CSIR's five operational priorities are translated from our strategic priorities into measurable business goals, so that performance against the longer-term priorities can be measured. This is done by determining short-term quantitative measures at specific output and outcome levels and measuring performance against the short-term goals. In summary, our business goals and performance against them are stated below.

Growth indicators	Target	Actual 1998	Actual 1997
	R'000	R'000	R'000
Total income (excl investment income)	693 732	688 774	652 367
Growth	6,3%	5,6%	15,2%
Parliamentary grant	316 583	336 255	304 030
Growth	4,1%	10,6%	16,9%
External operating income	377 149	352 519	348 337
Growth	8,3%	1,2%	13,8%
Expenditure	688 210	704 791	642 222
Growth	7,2%	9,7%	15,2%
Net margin	14,678	7 310	68 671
Growth	(78,6%)	(89,4%)	58,3%

Growing our business, in real terms

The goal has been to grow our external income by 6,3% to a total of R693,7 million, with a net margin of R14,6 million or 2,1% of external income. The total income earned for the year was R688,7 million (1996/97: R652,3 million), which was R4,9 million or 0,7% short of the set target. This shortfall in external income was mainly due to the lower achievement of sales in the national safety and security sector, caused by the late and severe cuts to our Defence Force contracts, together with a reduction in investment in research in the mining industry associated with the turbulence in that sector over the past year.

Our net margin, an important measure for sustainability in the longer term, was maintained despite the shortfall in external income. The margin of R7,3 million (1996/97: R68,6 million), against a budget of R14,6 million, was achieved after having made Board-approved provision for assets transferred to the Department of Environment Affairs and the writing off of goodwill that emanated from the Chamber of Mines Research Organisation (COMRO) merger in 1993.



External contract income

During the 1997/98 financial year, good penetration and external sales growth in support

As reflected below, these gains were offset by the disappointment of a mining

Sector – 31 March	5 year compound growth	1998	1997	1996	1995	1994
		R'000	R'000	R'000	R'000	R'000
External contract income	10,8%	347 982	334 213	300 285	261 747	251 343
Private sector	16,1%	173 582	180 601	170 888	149 166	133 950
Annual growth		(3,9%)	5,7%	14,6%	11,4%	62,6%
Public sector	4,4%	76 223	46 567	47 073	49 446	55 216
Annual growth		63,7%	(1,1%)	(4,8%)	(10,4%)	(10,0%)
National safety and security sector	4,3%	64 967	78 247	60 952	47 465	52 124
Annual growth		(17,0%)	28,4%	28,4%	(8,9%)	(1,0%)
Other sectors (including Africa)	21,8%	33 210	28 798	21 372	15 670	10 052
Annual growth		15,3%	34,7%	36,4%	55,9%	(19,0%)

of the public sector was realised, our new provincialisation drive was successfully implemented and meaningful contributions were made in refocusing certain competencies in support of the national crime prevention initiative.

industry in major transformation, with a corresponding reduction in commitment to contract research, and the late cuts in Defence Force contracts that significantly affected the CSIR's private and national safety and security income sectors.

Internationally active

The year under review has been a particularly eventful one for the CSIR's international activities. Our foreign income grew beyond budget to R32,2 million, which reflects an increase of 15,3% (1996/1997: R28,8 million); this in addition to significant strides in cementing several key international alliances and expanding our international networks (examples highlighted in *Technology Impact*).

Embedding quality in everything we do

The CSIR has continued to develop its approach to the management of quality. During the course of the year, we took a bold step by piloting internal Malcolm Baldrige National Quality Award (MBNQA) assessments. This is the first time that the Baldrige quality assessment has been used, as widely and comprehensively, in any organisation in South Africa.

Two of our divisions, Manufacturing and Aeronautical Systems Technology (Aerotek) and Materials Science and Technology (Mattek), completed assessments which were reviewed in the USA in 1996. Aerotek completed a new assessment for the 1997 CSIR internal

Executive Report

(continued)



Assisting the automotive industry . . .

An international workshop involving key automotive industry stakeholders was organised by the CSIR in collaboration with Fraunhofer-Gesellschaft and the Fraunhofer-Management-Gesellschaft of Germany. The workshop was strongly supported by both the South African and German governments as part of the Binational Commission's purpose of facilitating high-level dialogue and promoting co-operation on key issues of mutual concern.

process. The table below reflects the performance of five divisions and one corporate group, and will be used as a benchmark for future assessments.

Taken overall, the scores reflect a near average performance measured against international standards, where scores between 250 – 370 indicate average performance, while organisations with excellent quality performance achieve scores of above 450. Aerotek, the division with the leading score, attained an above average rating. We believe that the scores achieved are useful indicators of the overall quality drive of

the organisation and, more importantly, provide an international scale of measurement which challenges us not to relax our efforts to achieve excellence. The divisions used their participation in this assessment as a learning curve in preparation for a full assessment in 1999.

The results of the Baldrige assessments identified significant challenges in a number of divisions for improving business processes and quality systems. This has been the basis of quality planning for the divisions for the forthcoming financial year.

Stakeholder satisfaction and customer perceptions

A quantitative performance indicator of the CSIR's performance in this domain was derived from the perceptions of customers and stakeholders by means of regular monitoring.

A benchmark study was conducted during 1997. The Quality Index measured in this study was 71% as compared with 72% in the 1995 benchmark study, indicating that we are essentially holding our ground in an increasingly competitive environment, particularly from international competitors.

Some MBNQA assessment scores from the 1997 CSIR internal process			
Division/Group	Score	Division/Group	Score
Aerotek	385	Internal Services	345
Boutek	307	Mattek	269
Environmentek	215	Miningtek	265

The results of these surveys are used to determine appropriate strategies and monitor trends in the performance of the organisation as perceived by the market-place. We remain challenged to continuously improve in this critical domain of organisation performance.

Creating an increasingly innovative and rewarding working environment

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

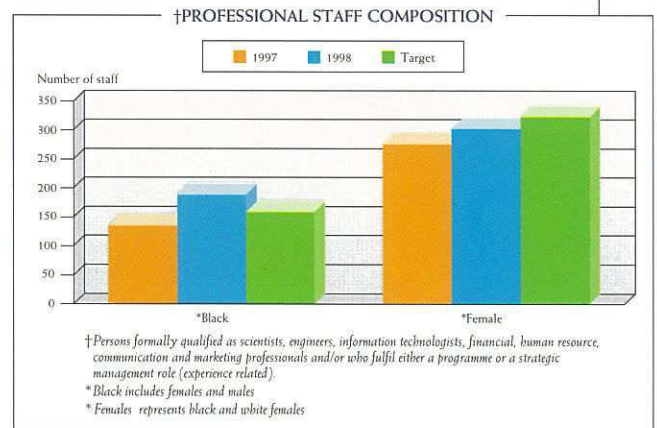
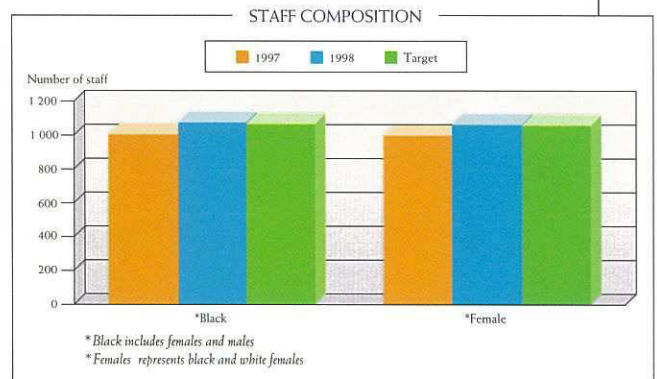
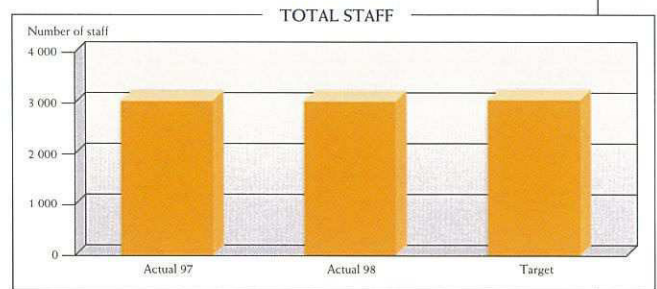
In response to this goal, the focus for 1997 was on transformation for the enhancement of innovation, restructuring for growth and global competitiveness, leadership development, and strategic partnering and alliances for business goal achievement.

A changing face

The distribution of our 3 026 (1996/97: 3 068) employees by race and qualifications, as well as the racial and gender composition of our professional staff, as at the end of March

1998, are reflected in the graphs on this page.

The average personnel turnover for the 1997/98 financial year was 18,3% (1996/97: 13,8%) including an unavoidable turnover of 11,3% (1996/97: 7,4%), mainly attributed to retrenchments (3%), contract completions (5%) and retirements (2%).

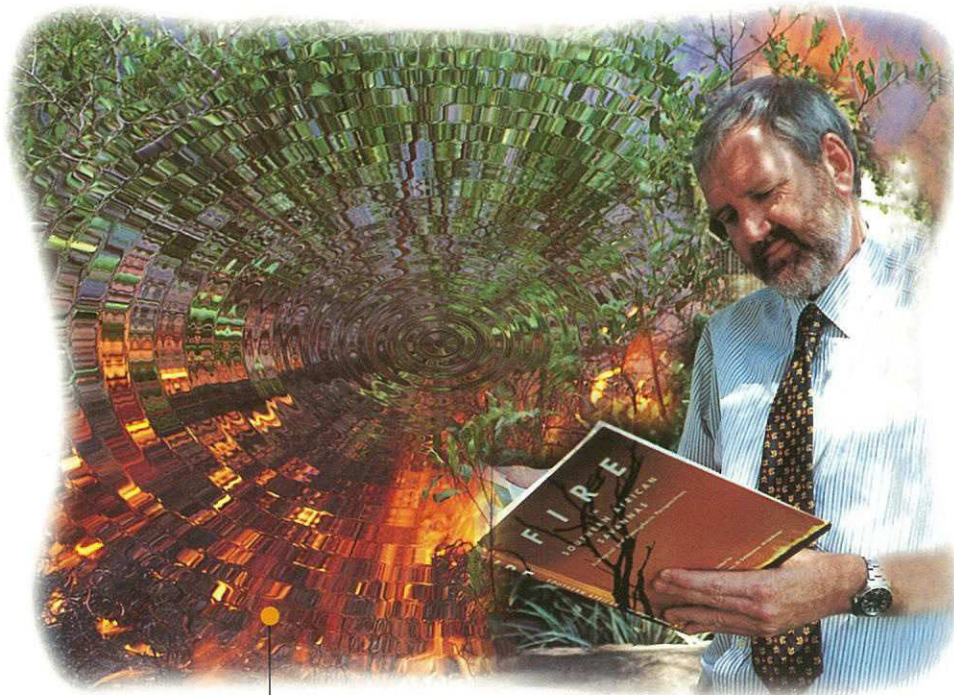


*New radio frequency . . .
The CSIR has started on implementing a new radio frequency plan for South Africa.*



Executive Report

(continued)



Veld fires . . .

The publication of a book Fire in Southern African Savannas: Ecological and atmospheric perspectives, edited by the CSIR, documents the contribution of veld fires to greenhouse gases and to climatic change. It provides an overview of the findings of the Southern African Fire-Atmosphere Research Initiative which attracted much international co-operation and funding and involved over 150 scientists from 14 countries.

CSIR bursary programme

During the year under review, progress in improving past imbalances in the CSIR's bursary programme continued. Of our 150 CSIR bursaries, 65% were black and 29% were female (1996/97: 116 bursaries, of whom 60% were black and 25% female). Of the 44 new bursaries awarded in 1997/98, 71% went to blacks and 46% to females. By comparison to 1993/94, when 40% of our bursaries were black and 22% were female, there has been significant improvement in this area, although we recognise that there is still a long way to go.

Training for excellence

In terms of the CSIR's formal education initiatives, such as our in-house Adult Basic Education and Apprentice Training Centres, we have trained 100 black staff members (1996/97: 80) and provided in-service training and internship opportunities to 80 students (1996/97: 46) studying for diplomas and degrees.

Our Technology Leadership Programme (TLP) serves to enhance the understanding of employees of the social and economic value of technology. During 1997/98 the programme accommodated 13 CSIR professionals, of whom 7 were black and 6 were female (1996/97: 11 CSIR professionals, of whom 7 were black and 6 were female).

The CSIR's Advanced Leadership Programme (ALP) has been operating for three years and is focused on equipping the organisation with leaders for the future. The two ALP programmes in 1997/98 accommodated a total of 39 candidates, 13 of whom were black and 16 were female (1996/97: 26 candidates, of whom 9 were black and 10 were female).

Measuring our internal climate

A climate survey to determine employee satisfaction levels is conducted at six-monthly intervals. These surveys constitute a measurement instrument for assessing alignment of human resource management plans and processes with overall organisation goals and strategy. Questions are asked of individuals in the domains of job fulfilment, organisational climate,

employment equity, leadership and organisational effectiveness. The consolidated results are used to derive an "overall satisfaction" index for each operational area.

Divisional targets are set and the feedback received provides a focus for management attention. The results are used effectively in divisions to indicate levels of satisfaction and to reflect levels of dissatisfaction, especially in areas where traditional behaviour is challenged by the need to work in innovative ways and across team boundaries.

During the year under review, the surveys were completed in June and December 1997. Overall employee satisfaction indices of 70% and 69% respectively were achieved (satisfaction indices per division are reflected in the graph).

The emergence of new organisational designs, such as striving to build a boundary-less organisation, will make the use of the internal climate assessment even more crucial in the future.

Labour relations

The wage negotiations in 1997 were successfully completed. A process to ensure alignment with the Basic Conditions of

Employment Act has been initiated, as the outcome of this will impact on the CSIR's employment practices, especially on our remuneration management. The relationship between the CSIR and the union, NEHAWU, is not optimal, and mutual relationship-building initiatives and more focused attention will be given to promoting engagement of the union in labour matters, as identified by the Labour Relations Act, in the coming financial year.

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. It is based on managed health care principles, with a strong emphasis on co-responsibility between employer and employee. The fund is administered by Visimed and governed by a board of trustees



Upgrading . . .

With upgraded facilities at the Satellite Applications Centre, the CSIR will support future missions of the US-based Hughes Space and Communications in the Ku/Ka band, and other space craft operators.



Information society . . .

At a dedicated facility, the CSIR offers training in Asynchronous Transfer Mode for IT and network specialists.



Executive Report

(continued)



Creating opportunities . . .

The Lubisi Dam project is an integrated and integrative project which aims at demonstrating a wide range of suitable technologies in both infrastructure provision and the creation of jobs.

Twenty-three villages in the area are fully committed to the project. The communities are represented through the Lubisi Dam Development Forum (LDDF) and the CSIR is the LDDF's technology partner.

A training and accommodation centre has been established from where capacity-building and job-creation pilot projects can be initiated. The building of the centre created jobs within the community.



consisting of Mr Albert Jordaan (Chairman), Dr Namane Magau, and Ms Suzette Harmse.

Pension fund

The pension fund is registered in terms of the Pension Funds Act, Act 24 of 1956, and is a defined contribution plan. The fund performed well compared to similar funds, with an average growth achievement of 20% (1996/97: 19%). The fund is governed by a board of trustees consisting of Mr Albert Jordaan (Chairman), Ms Suzette Harmse, Helena Heystek and Paula Norman and Messrs Philip Masemola, Daniel Mosito, Thabo Poee and Gerhard Smith.

Making an impact on sustainable development

During the year under review, our Technology for Development (TfD) initiative has undergone a transformation from a primarily strategic networking and positioning function to a CSIR-wide integrative function which, in partnership with stakeholders and beneficiaries, delivers according to national needs in specified areas.

Performance against the key focus areas for the TfD initiative for 1997/98 is summarised below:

High Impact Integrated Projects (HIIPs)

Over the past year, the CSIR has served as a technology provider and facilitator in HIIPs, notably Lubisi in the Eastern Cape and Manguzi in KwaZulu-Natal. Of the R2 million budgeted for the establishment of a training and development centre at Lubisi, R1,9 million was utilised to build the centre and establish incubator projects in the centre. The project was 90% complete at the end of the 1997/98 financial year. On behalf of the Lubisi Dam Development Forum, we also helped to facilitate applications

for more than R25 million in water supply schemes for their villages.

Small, medium and micro enterprises (SMMEs)

For the past financial year an investment of R9,3 million was made in the area of small, medium and micro enterprises, specifically through our SMME integrative thrust. An amount of R7,5 million was invested in strategic initiatives and in partnerships with other role players and stakeholders. Of this, R5 million was invested in the Manufacturing Advisory Centre Programme, a joint venture between the CSIR, the Department of Trade and Industry through the Ntsika Enterprise Promotions Agency, the National Productivity Institute and the Danish funding agency, DANIDA. The programme was launched in August 1997 and aims to provide assistance to SMMEs to enhance their growth. The remaining R2,5 million was invested in the Business Referral and Information Network Programme (BRAIN), a national initiative to provide information to small businesses and help them identify and access business opportunities.

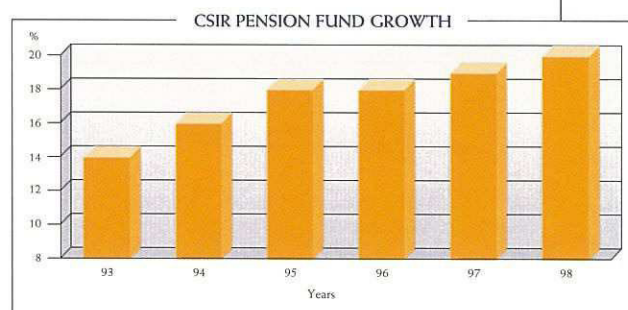
The balance of the investment went towards managing the initiative and investing in divisional integrative activities, mainly to support the development of information support systems to SMMEs and the installation of textile demonstrators for training purposes.

Rural development centres

In partnership with the North West Development Corporation, we launched a pilot Entrepreneurial Service Centre in Mogwasi in the North West Province during March 1998. This pilot, mandated by the provincial economic and finance departments, has already involved five small businesses in the area.

Indigenous technologies

The CSIR's involvement in this initiative, that focuses on the identification of technologies and traditional knowledge existing in different, mostly historically disadvantaged communities in South Africa, centres around partnerships with historically disadvantaged universities to create a national



Determining detectability . . .

The Fynmeet mobile laboratory was developed and built for the South African Air Force by the CSIR. It is used to determine the detectability of an aircraft by radar sensors.



International standards . . .

High quality engineering solutions are provided for South African industry at the CSIR's Thermal Spray and Repair facility which is ISO 9001 certified.



Executive Report

(continued)



Saving money . . .

Enormous savings in excess of R3m a year have been achieved at two manufacturing companies through the CSIR's Competitiveness Improvement Programme. The service is designed to help South African manufacturers enhance their productivity and ultimately their global competitiveness.

At one company, an analysis of its operations showed that it was utilising only 30% of its plant. This was improved to 70%, realising an annualised saving of R2,5m. A further R1m was saved through the implementation of quality training.

At the second company, annualised savings of R3,2m were achieved through optimising its capacity utilisation and improving its product throughput.

database for technologies and traditional knowledge systems. The fieldwork of the audit phase has been completed and the next step will be to identify opportunities to commercialise the technology and knowledge that has business and market potential, to the advantage of the communities of origin.

Following the visit to the CSIR in 1997 by Dr R Mashelka (one of the DACST Review Panel members and Director General of the CSIR in India), a study tour to India has been suggested for the new financial year to exchange ideas on how research in indigenous technologies in India has taken place over the years and in particular, how intellectual property has been protected.

Harnessing the information revolution in the way we do business

"Information intensity" is increasing in all aspects of the CSIR's activities. CSIR divisions have explicit plans and strategies in order to play a leading role in harnessing this revolution. During the year under review, the CSIR created an office for a Chief Information Officer and initiated a process of transforming our enterprise infrastructure to conform with international best practice. A further focus will be on effective knowledge management, a key issue for a knowledge worker organisation. In addition, we seek to understand the impact on and opportunities provided for our organisation by the Internet, modelling, simulation and virtual reality, and to act decisively to provide these benefits to our entire client community.

Year 2000

During the year under review, the CSIR has conducted an inventory and business analysis of all its computer and embedded software systems to determine compliance with the Year 2000 date format. We have put in place an upgrading and modification process of existing

software and hardware and believe that, completed to schedule, the conversion process will ensure that the Year 2000 issue will not cause disruption or pose significant operational problems to the organisation.

Costs to the CSIR for Year 2000 compliance are being treated as a cost of normal operations. In addition, an amount of R4,9 million has been provided for and charged to the income statement this year. This amount covers projects that will be executed in the new financial year.

Remedial strategies provide opportunities to upgrade existing systems, provide better asset management and an improved knowledge management infrastructure to serve our clients more effectively, now and in the future.

Managing the Parliamentary Grant

The Parliamentary Grant allocated to the 1997/98 financial year amounted to R336,3 million (1996/97: R304 million), which represented a growth of 10,6% over the previous year. Although not high in nominal terms, the investment nature of the grant is relevant and is seen as a

strong vote of confidence from stakeholders in the CSIR.

This grant continues to be the key investment resource of the CSIR and is used 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 the CSIR continued to develop its approach to technology management and investment of the Parliamentary Grant. The DACST-led CSIR Review Panel evaluated positively the approach that is used both strategically and operationally for the management of the Parliamentary Grant and the system was used very extensively in providing inputs to the review panel on the CSIR's technology portfolio and approach to technology investment.

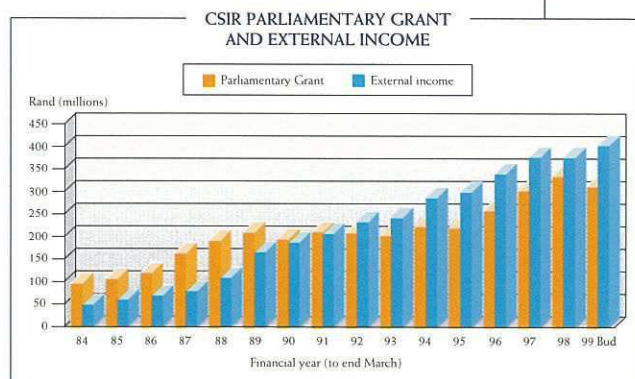
With 47% of its income funded by the Parliamentary Grant, or public funds, the growth in the CSIR's earnings from external sources compares very favourably with similar institutions in the international arena. With a few exceptions, international

parastatal research organisations have public funding levels in excess of 50%, often considerably so.

Organisation changes

Acquisition

In January 1998, Swift Micro Laboratories was acquired and incorporated into the CSIR's Division of Food Science and Technology as the Swift Programme. The acquisition of Swift, the first nationally accredited microbiological testing services laboratory in South Africa, will mean that the CSIR is positioned to deliver rapid and efficient services to



Executive Report

(continued)



Birth of a new label . . .

When the CSIR was asked to assist in identifying development opportunities for the rural communities in the Eastern Cape, it established a new label "Lubisi Legends", which marks a range of superb quality products with a traditional AmaXhosa flavour. Made by local women, the collection includes cushions, quilts, wall hangings and office accessories.

the food industry for the detection and identification of contaminating organisms. The merger added 29 people to the CSIR's staff complement.

Other key initiatives

New systems

During the course of the financial year, a system was developed to capture all the publications and documentary outputs of the CSIR. This system was developed to support the internal processes of individual divisions and to ensure that there is a single point of entry for all documents developed by the CSIR.

We significantly extended our Intranet during 1997 and, in response to an electronic

communication campaign to popularise the use of the IntraWeb. Good use is now made of this electronic business tool, both in divisions and across the full spectrum of the CSIR.

After a decision taken in April 1997 to change the platform for the CSIR's Data Warehouse and Executive Information System, the process of developing an Executive Information System accelerated. This system is being used by senior managers in the organisation to trace core executive information that is essential to the smooth and sound operation of the CSIR's business.

CSIR 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 profit of the subsidiaries amounts to R1,8 million.

Post-balance sheet events

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

Board approval

The annual financial statements of the CSIR for the year ended

31 March 1998, as set out on pages 24 to 64 of this report, have been approved by the CSIR's executive management and the CSIR Board at its meeting held on 10 June 1998. 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

10 June 1998

Dr Geoff G Garrett
CSIR President



WITH APPROPRIATE SUPPORT FROM GOVERNMENT AND CONTINUED SOUND MANAGEMENT AND INNOVATION, THE CSIR CAN CONTINUE TO CONTRIBUTE SIGNIFICANTLY TO THE ECONOMIC WELL-BEING OF OUR COUNTRY!

International Review Panel

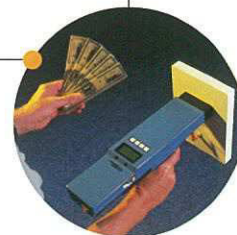
Monitoring changes . . .

The structured condition of an aircraft can be rapidly and cost efficiently established with techniques developed at the CSIR's Ground Vibration Test Centre.



New development . . .

Refinements have been made to Supertag™, the CSIR's world beating application of Radio Frequency Identification. The reader is now available as a hand-held battery operated unit.



Five-year Financial Review

31 March 1998

	1998	1997	1996	1995	1994
	R'000	R'000	R'000	R'000	R'000
<i>Financial indicators</i>					
Total reserves	353 555	346 245	460 574	417 189	413 578
Long-term liabilities	14 842	14 932	—	—	—
Total assets	505 054	468 794	566 927	555 248	533 168
Net assets	368 397	361 177	460 574	417 189	413 578
<i>Income and expense report</i>					
Parliamentary grant	336 255	304 030	260 128	233 314	240 120
External operating income	352 519	348 337	305 980	268 399	260 165
Expenditure	704 791	642 222	557 608	529 808	500 379
Investment income	23 327	58 526	34 885	31 706	28 075
Net income	7 310	68 671	43 385	3 611	27 981
<i>Cash flow</i>					
Net cash flow from operating activities	57 645	73 043	36 801	40 493	24 610
Net cash outflow from investing activities	(47 991)	(43 544)	(30 470)	(40 742)	(39 259)
Net cash flow from financing activities	(90)	(175 068)	—	(317)	—
Cash and cash equivalents beginning of year	44 758	190 327	183 996	184 562	199 211
Cash and cash equivalents end of year	54 322	44 758	190 327	183 996	184 562
<i>Ratio analysis</i>					
<i>Asset management</i>					
Net asset turn	1,93	1,97	1,30	1,28	1,28
Return on net assets	1,98%	19,01%	9,42%	0,87%	6,77%
Current ratio	1,51	1,68	2,88	2,21	2,48
<i>Performance</i>					
Total income (excl. investment income) per employee	228	213	177	187	184
Total external operating income per employee	116	114	96	100	96
Net cash generated from operating activities per employee	19	24	12	15	9
Independence ratio	52,78%	57,23%	56,72%	56,26%	54,55%

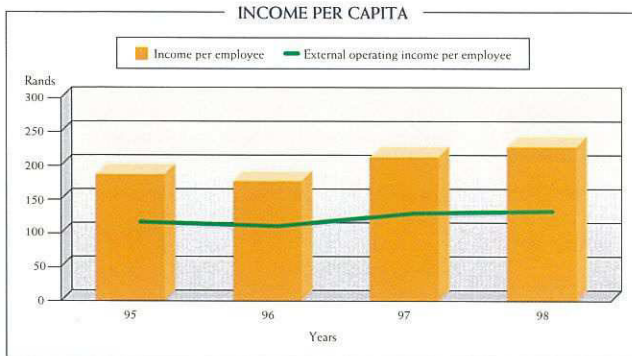
Definitions

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

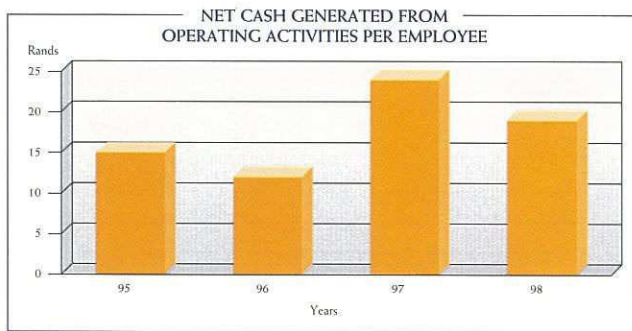
Return on net assets – Net income expressed as a percentage of net assets

Current ratio – Current assets divided by current liabilities

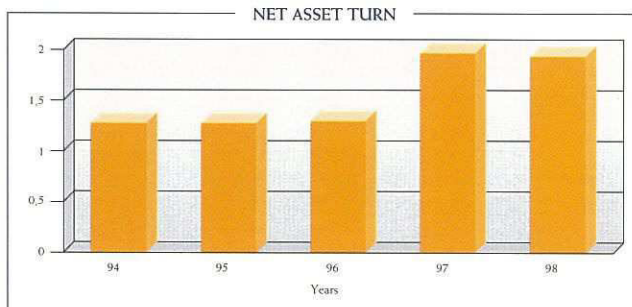
Independence ratio – Total external income (including investment income) divided by total income



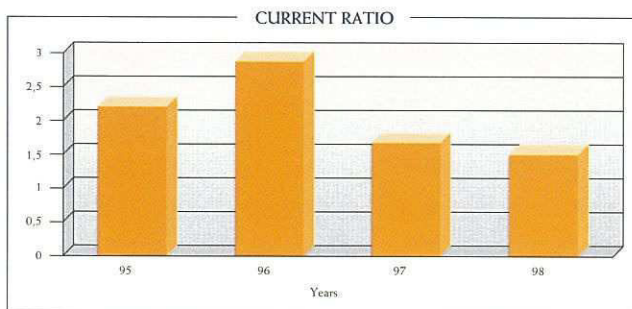
Income per employee continues to improve despite an overall national reduction in research and development investment.



Net cash generated from operating activities per employee remains positive; the sharp increase in 1997 was due to dividends received of R29 million.



The increase in net asset turn is a result of the reduction on current assets (R190 million transferred to the CSIR Medical Aid Scheme at the end of March 1998).



Current ratio of 1,5 reflects the CSIR's ability to maintain its liquidity despite the transfer of R190 million at the end of March 1998 to fund the post-retirement medical cost of CSIR pensioners.

Income Statement

for the year ended 31 March 1998

	Notes	GROUP		CSIR	
		1998 R'000	1997 R'000	1998 R'000	1997 R'000
Turnover	2	691 575	644 501	687 800	641 315
Other income		974	915	974	915
Profit on disposal of fixed assets		—	10 137	—	10 137
Profit on disposal of patent		3 316	—	—	—
Total operating income		695 865	655 553	688 774	652 367
Expenditure					
Employees' remuneration		343 654	325 148	343 654	325 148
Depreciation	6	31 231	26 353	31 193	26 313
Operating expenses		334 321	295 205	328 589	290 761
Loss on disposal of fixed assets		1 357	—	1 355	—
Total expenditure		710 563	646 706	704 791	642 222
Net operating (deficit)/surplus for the year before investment income	4	(14 698)	8 847	(16 017)	10 145
Income from investments	7	23 839	35 450	23 327	58 526
Net surplus for the year		9 141	44 297	7 310	68 671
Transfer to self-insurance fund		—	3 000	—	3 000
Accumulated funds at the beginning of the year		322 008	470 711	336 245	460 574
Change in accounting policy	3	—	190 000	—	190 000
Accumulated funds at the end of the year		331 149	322 008	343 555	336 245

Balance Sheet

31 March 1998

	Notes	GROUP		CSIR	
		1998 R'000	1997 R'000	1998 R'000	1997 R'000
<i>Capital employed</i>					
Total accumulated funds		341 149	332 008	353 555	346 245
Accumulated funds		331 149	322 008	343 555	336 245
Self-insurance fund	14	10 000	10 000	10 000	10 000
Long-term liabilities	12	7 059	7 113	14 842	14 932
Total capital employed		348 208	339 121	368 397	361 177
<i>Employment of capital</i>					
Fixed assets	6	240 958	225 513	240 815	225 372
Investments	8	31 424	36 594	30 000	35 000
Interest in subsidiaries and associate companies	5	—	—	27 220	27 220
Net current assets		75 826	77 014	70 362	73 585
Current assets		214 365	186 207	207 019	181 202
Debtors and advances	9	127 779	109 639	126 499	108 864
Stock and contracts in progress	10	26 268	27 678	26 198	27 580
Cash and short-term deposits		60 318	48 890	54 322	44 758
Current liabilities		138 539	109 193	136 657	107 617
Advances received	11	7 442	9 891	7 442	9 683
Creditors and provisions		131 097	99 302	129 215	97 934
Total employment of capital		348 208	339 121	368 397	361 177

Cash Flow Statement

for the year ended 31 March 1998

	Note	GROUP		CSIR	
		1998 R'000	1997 R'000	1998 R'000	1997 R'000
Cash flow from operating activities					
Cash receipts from external customers		334 824	317 560	342 428	320 717
Parliamentary grant received		336 255	304 030	336 255	304 030
Cash paid to suppliers and employees		(637 964)	(612 205)	(644 365)	(610 230)
Cash generated from operating activities	A	33 115	9 385	34 318	14 517
Investment income received		23 839	35 450	23 327	58 526
Net cash inflow from operating activities		56 954	44 835	57 645	73 043
Cash flow from investing activities					
Fixed assets acquired		(49 675)	(58 832)	(49 632)	(58 807)
Proceeds from the sale of fixed assets		1 642	15 263	1 641	15 263
Net acquisition of long-term patents		(1 011)	(199)	—	—
Proceeds from the sale of patent		3 572	—	—	—
Net cash outflow from investing activities		(45 472)	(43 768)	(47 991)	(43 544)
Cash flows from financing activities					
(Decrease)/increase in long-term loan		(54)	(353)	(90)	14 932
Transfer to medical aid		—	(190 000)	—	(190 000)
Net cash outflow from financing activities		(54)	(190 353)	(90)	(175 068)
Net increase/(decrease) in cash and cash equivalents		11 428	(189 286)	9 564	(145 569)
Cash and cash equivalents at beginning of the year		48 890	238 176	44 758	190 327
Cash and cash equivalents at end of the year		60 318	48 890	54 322	44 758

Note to the Cash Flow Statement

for the year ended 31 March 1998

	GROUP		CSIR	
	1998 R'000	1997 R'000	1998 R'000	1997 R'000
<i>A. Reconciliation of net operating (deficit)/surplus for the year before investment income to cash generated from operations</i>				
Net operating (deficit)/surplus for the year before investment income	(14 698)	8 847	(16 017)	10 145
Adjusted for:				
Depreciation	31 231	26 353	31 193	26 313
Loss/(profit) on disposal of fixed assets	1 357	(10 137)	1 355	(10 137)
Profit on disposal of patent	(3 316)	—	—	—
Investment in trade agreement written off	5 000	—	5 000	—
Write off of investment in subsidiary	—	505	—	—
Loan write off in subsidiary	—	500	—	—
Technology advances written off	277	276	—	—
Amortisation of technology licensing projects	648	297	—	—
Operating profit before changes in working capital	20 499	26 641	21 531	26 321
Increase in debtors and advances	(18 140)	(15 762)	(17 635)	(15 425)
Decrease/(increase) in stock and contracts in progress	1 410	(4 706)	1 382	(4 643)
(Decrease)/increase in advances received	(2 449)	4 159	(2 241)	4 269
Increase/(decrease) in creditors and provisions	31 795	(947)	31 281	3 995
Net working capital changes	12 616	(17 256)	12 787	(11 804)
Cash generated from operations	33 115	9 385	34 318	14 517

Notes to the Annual Financial Statements

for the year ended 31 March 1998

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.

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.

Premiums arising on the acquisition of subsidiaries are written off on acquisition and are only recognised as an asset if future income is anticipated. In this situation, the goodwill is amortised to income on a systematic basis over its useful life.

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 1998.

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. *Principal accounting policies (continued)*

1.4 Foreign currencies

Assets and liabilities in foreign currencies are converted to South African rand at the rate of exchange ruling at the year-end date or rates stipulated in forward exchange contracts. Conversion differences are dealt with in the income statement. Transactions during the year are converted to the South African rand at the rate of exchange ruling at date of payment, unless forward exchange contracts have been secured. Forward exchange contracts are secured for all material foreign liabilities. Unspecified forward exchange contracts are valued at spot rate at year-end.

1.5 Fixed assets and depreciation

1.5.1 Land and buildings

Land and buildings are stated at cost. Buildings are regarded as investment properties and are not depreciated. 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).

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

1. Principal accounting policies (continued)

1.5 Fixed assets and depreciation (continued)

1.5.1 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 fixed assets 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

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 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 Stock and contracts in progress

Raw materials and finished goods are stated at the lower of cost and net realisable value. Cost of stock is determined by the average method. Contracts in progress are stated at the lower 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 Comparative figures

Where necessary comparative figures have been re-stated to ensure comparability.

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

	GROUP				CSIR			
	1998 R'000	%	1997 R'000	%	1998 R'000	%	1997 R'000	%
2. <i>Turnover</i>								
Parliamentary grant	336 255	49	304 030	47	336 255	49	304 030	47
Contract income	351 757	50	337 399	52	347 982	50	334 213	52
Private sector	177 357	26	183 787	29	173 582	25	180 601	28
Public sector	76 223	11	46 567	7	76 223	12	46 567	7
National Safety and Security sector	64 967	9	78 247	12	64 967	9	78 247	12
Other sectors (including Africa)	33 210	4	28 798	4	33 210	4	28 798	5
Royalties	3 563	1	3 072	1	3 563	1	3 072	1
Total turnover	691 575	100	644 501	100	687 800	100	641 315	100

	GROUP		CSIR	
	1998 R'000	1997 R'000	1998 R'000	1997 R'000
3. <i>Change in accounting policy</i>				
Post-retirement medical aid	—	190 000	—	190 000

During the prior year the CSIR changed its accounting policy for post-retirement medical benefits in order to recognise future obligations. In the past the CSIR did not make provision for the future liability arising from its obligation to provide for the cost of medical benefits to retired employees (refer note 13).

Results for the prior year and accumulated funds at the beginning of the prior year have not been restated because it was impractical to do so.

	GROUP		CSIR	
	1998 R'000	1997 R'000	1998 R'000	1997 R'000
4. <i>Net operating (deficit)/surplus for the year before investment income</i>				
The net operating (deficit)/surplus for the year before investment income is arrived at after taking the following items into account:				
Auditors' remuneration	921	899	846	854
Audit fees	867	846	798	801
Expenses	54	53	48	53
Exchange losses	120	680	120	680
Fees paid for services	61 736	48 546	61 573	48 546
Patent costs	1 925	1 373	1 925	1 373
Legal costs	1 323	1 525	1 323	1 525
Consultants	58 488	45 648	58 325	45 648
Board members' emoluments				
For services on the Board	125	130	125	130
Abnormal item				
Investment in trade agreement written off	5 000	—	5 000	—

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

5. Interest in subsidiaries and associate companies

Consolidated subsidiaries	Issued capital	Effective holding		Financial year-end	Shares at cost	
		1998 %	1997 %		1998 R'000	1997 R'000
South African Inventions Development Corporation (SAIDCOR)	27 220	100	100	31 March	27 220	27 220
Included in SAIDCOR:						
Technology Finance Corporation (Pty) Limited (TECHNIFIN)	5 200	100	100	30 June	4 400	4 400
Included in Technifin carrying value:						
Quality Electronics Developments (Pty) Limited	1 000	76	76	30 June	—	—

Associate companies	Issued capital	Effective interest		Financial year-end	Carrying amount	
		1998 %	1997 %		1998 R'000	1997 R'000
Unlisted:						
Impulse Deflection Measurement (Pty) Limited	1 000	—	25	28 February	—	—
Rockradar (Pty) Limited	100	—	25	31 March	—	—
Carrying amount – note 8					—	—

INTEREST OF THE CSIR

Net indebtedness		Net investment		General nature of business
1998	1997	1998	1997	
R'000	R'000	R'000	R'000	
—	—	27 220	27 220	Investment in research development and implementation of technology.
—	—	—	—	The acquisition and transfer of technology to industry by licensing new inventions, providing finance to develop technology and venture capital for the exploitation thereof.
—	—	—	—	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.

CSIR

Cost or valuation		Indebtedness		Provision for losses		General nature of business
1998	1997	1998	1997	1998	1997	
R'000	R'000	R'000	R'000	R'000	R'000	
—	—	—	126	—	(126)	Impulse deflection measurements.
—	—	—	300	—	(300)	Exploitation of intellectual property rights.
—	—	—	426	—	(426)	

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

	Depreciation for the year R'000	1998		1997		Net book value R'000	Net book value R'000
		Accumulated Cost depreciation R'000	Net book value R'000	Accumulated Cost depreciation R'000	Net book value R'000		
6. Fixed assets							
GROUP							
Land and buildings	—	136 106	—	136 106	126 385	—	126 385
Equipment	30 844	382 812	279 302	103 510	390 593	292 788	97 805
Vehicles	387	3 092	1 750	1 342	3 068	1 745	1 323
	31 231	522 010	281 052	240 958	520 046	294 533	225 513
CSIR							
Land and buildings	—	136 106	—	136 106	126 385	—	126 385
Equipment	30 806	382 354	278 987	103 367	390 171	292 507	97 664
Vehicles	387	3 092	1 750	1 342	3 068	1 745	1 323
	31 193	521 552	280 737	240 815	519 624	294 252	225 372

	1998			
	Net book value			
	Land and buildings R'000	Equipment R'000	Vehicles R'000	Total R'000
GROUP				
Opening balance	126 385	97 805	1 323	225 513
Additions	11 593	37 656	426	49 675
Disposals	(1 872)	(1 107)	(20)	(2 999)
Depreciation	—	(30 844)	(387)	(31 231)
	136 106	103 510	1 342	240 958
CSIR				
Opening balance	126 385	97 664	1 323	225 372
Additions	11 593	37 613	426	49 632
Disposals	(1 872)	(1 104)	(20)	(2 996)
Depreciation	—	(30 806)	(387)	(31 193)
	136 106	103 367	1 342	240 815

Land and buildings are unencumbered and full details of the titles are available at the registered office of the CSIR

	GROUP		CSIR	
	1998 R'000	1997 R'000	1998 R'000	1997 R'000
7. Income from investments				
Interest earned	23 839	35 450	23 327	29 526
Dividends from subsidiary	—	—	—	29 000
	<u>23 839</u>	<u>35 450</u>	<u>23 327</u>	<u>58 526</u>
8. Investments				
Loans to associate companies (Note 5)	—	426	—	426
Impulse Deflection Measurement (Pty) Ltd	—	126	—	126
Rockradar (Pty)Ltd	—	300	—	300
Provision for losses	—	(426)	—	(426)
Impulse Deflection Measurement (Pty) Ltd	—	(126)	—	(126)
Rockradar (Pty)Ltd	—	(300)	—	(300)
Investments held by Technology Finance Corporation (Pty) Ltd	1 424	1 594	—	—
Fixed deposit	30 000	30 000	30 000	30 000
Investment in trade agreement	—	5 000	—	5 000
	<u>31 424</u>	<u>36 594</u>	<u>30 000</u>	<u>35 000</u>
9. Debtors and advances				
Trade debtors	86 009	88 676	84 729	87 901
Prepaid expenses	23 126	3 183	23 126	3 183
Other	18 644	17 780	18 644	17 780
	<u>127 779</u>	<u>109 639</u>	<u>126 499</u>	<u>108 864</u>

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

	GROUP		CSIR	
	1998 R'000	1997 R'000	1998 R'000	1997 R'000
10. Stock and contracts in progress				
Stock	6 065	3 723	5 995	3 625
Contracts in progress	20 203	23 955	20 203	23 955
	26 268	27 678	26 198	27 580
11. Advances received				
Advances on contracts received from clients	7 442	9 891	7 442	9 683
12. Long-term liabilities				
Unsecured				
IDC	7 059	7 113	—	—
<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>				
SAIDCOR				
<p>This is an interest-free loan with no fixed terms of repayment.</p>				
	—	—	14 842	14 932
	7 059	7 113	14 842	14 932

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 R20,1 million (1997: R18,1 million) and employee contributions of R12,2 million (1997: R11 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 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 R1,2 million (1997: R1,9 million) and employee contributions of R493 000 (1997: R755 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 32 (1997: 53) employees who are members of the AIPF and 5 (1997: 10) 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 R462 003 (1997: R534 614) and employee contributions of R158 302 (1997: R222 879) 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 in the prior year, 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.

Notes to the Annual Financial Statements

for the year ended 31 March 1998 (continued)

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 are of a minor and infrequent nature. Self-insured risks are reviewed on an annual basis to ensure cover is adequate. An amount of R10 million (1997: 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	
	1998	1997	1998	1997
	R'000	R'000	R'000	R'000
<hr/>				
15. Contingent liabilities				
There are contingent liabilities in respect of				
– Bank guarantees in respect of third party liabilities	11 338	4 544	11 338	4 544
<hr/>				
16. Capital commitments				
Authorised but not contracted	20 500	10 172	20 500	10 172
This capital expenditure is to be financed from internal sources.				
<hr/>				