ANNUAL REPORT
2013 • 14

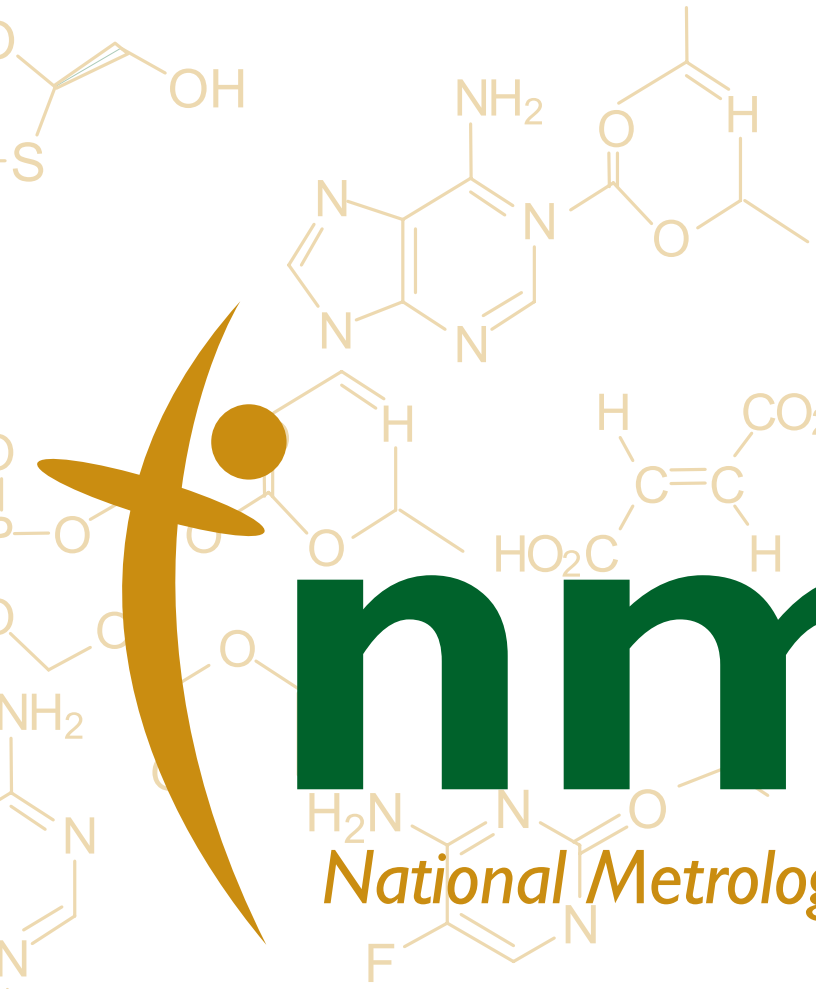
nmisa
National Metrology Institute of South Africa

Your measure of excellence

Submission of the Annual Report by the Chairperson of the Board

It is with great pleasure that I, as the Chairperson of the Board of the NMISA, submit the performance and progress of the entity for the financial year 2013/14 in terms of the Public Finance Management Act, Act No. 1 of 1999.

Dr Prinsloo Nevhutalu
Chairperson of the Board



nmisa

National Metrology Institute of South Africa

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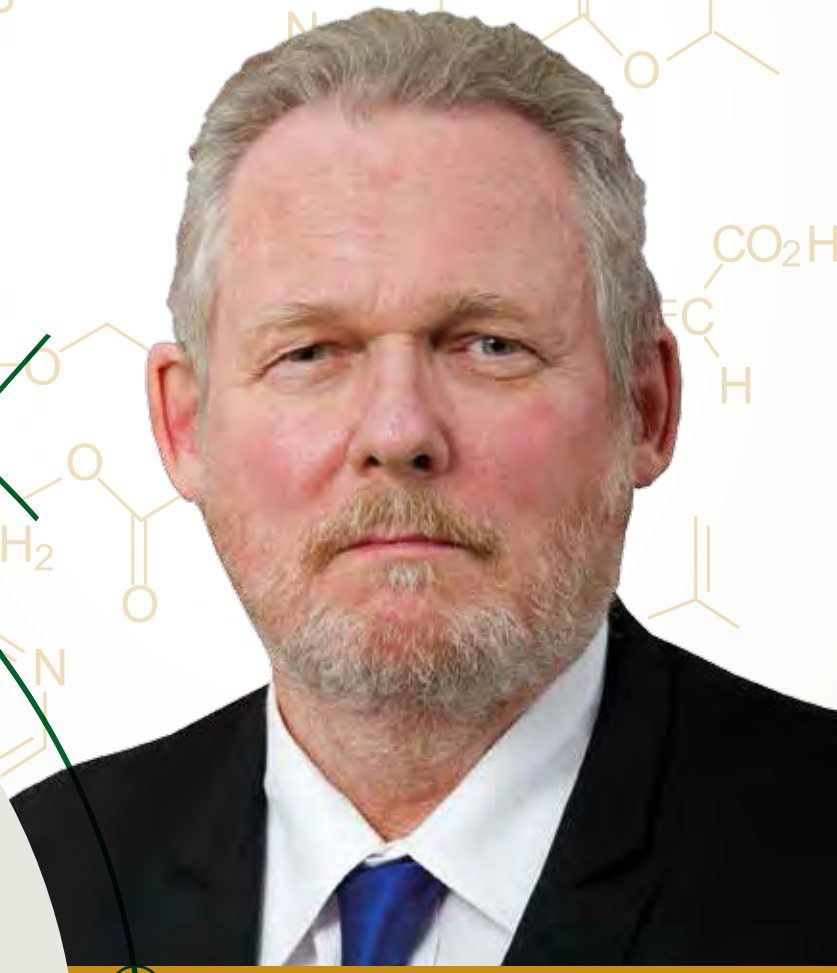
PART 1

STRATEGIC OVERVIEW

COMPANY INFORMATION

Name	National Metrology Institute of South Africa (NMISA)
Physical Address	Meiring Naudé Road Brummeria Pretoria
Postal Address	Private Bag X34 Lynnwood Ridge 0040 South Africa
Telephone Number	+27 (12) 841 4152
Fax Number	+27 (12) 841 2131
E-Mail Address	info@nmisa.org
Website Address	www.nmisa.org
External Auditors	EY Johannesburg
Bankers	Standard Bank Lynnwood Ridge Pretoria
Company/Board Secretary	Mr Charles Kgoale

1.1 OVERVIEW BY THE MINISTER OF the dti



"The role of the NMISA is to assist priority sectors that have been underpinned by the development and implementation of programmes to upgrade and develop measurement capabilities and standards in support of especially green industries, agro-processing and automotive sectors."

Dr Rob Davies

It gives me great pleasure to present the Annual Report of the National Metrology Institute of South Africa (NMISA). The NMISA together with the other Technical Infrastructure (TI) institutions continues to contribute to the industrial development efforts coordinated through the industrial Policy Action Plan (IPAP) which has since become the centrepiece of the dti's work. The NMISA provides the South African Measurement System with a link to the international system by providing and maintaining the National Measurement Standards (NMS) and seeing to the use and correct application of the International System of Units (the SI) and certain other units.

The role of the NMISA is to assist priority sectors that have been underpinned by the development and implementation of programmes to upgrade and develop measurement capabilities and standards in support areas such as green industries, agro-processing and automotive sectors. Other focus sectors in line with the IPAP include pharmaceuticals, cosmetics, chemicals, advanced manufacturing, clothing textiles, plastics and ICT. Measurement support for mineral beneficiation, metals fabrication and issues of national concern such as food safety, health care and law enforcement continues to be central to activities of the NIMISA. Long-term multi-disciplinary research programmes in accurate measurement are being developed to support innovation and emerging technologies, as well as national and government initiatives such as the Square Kilometre Array (SKA).

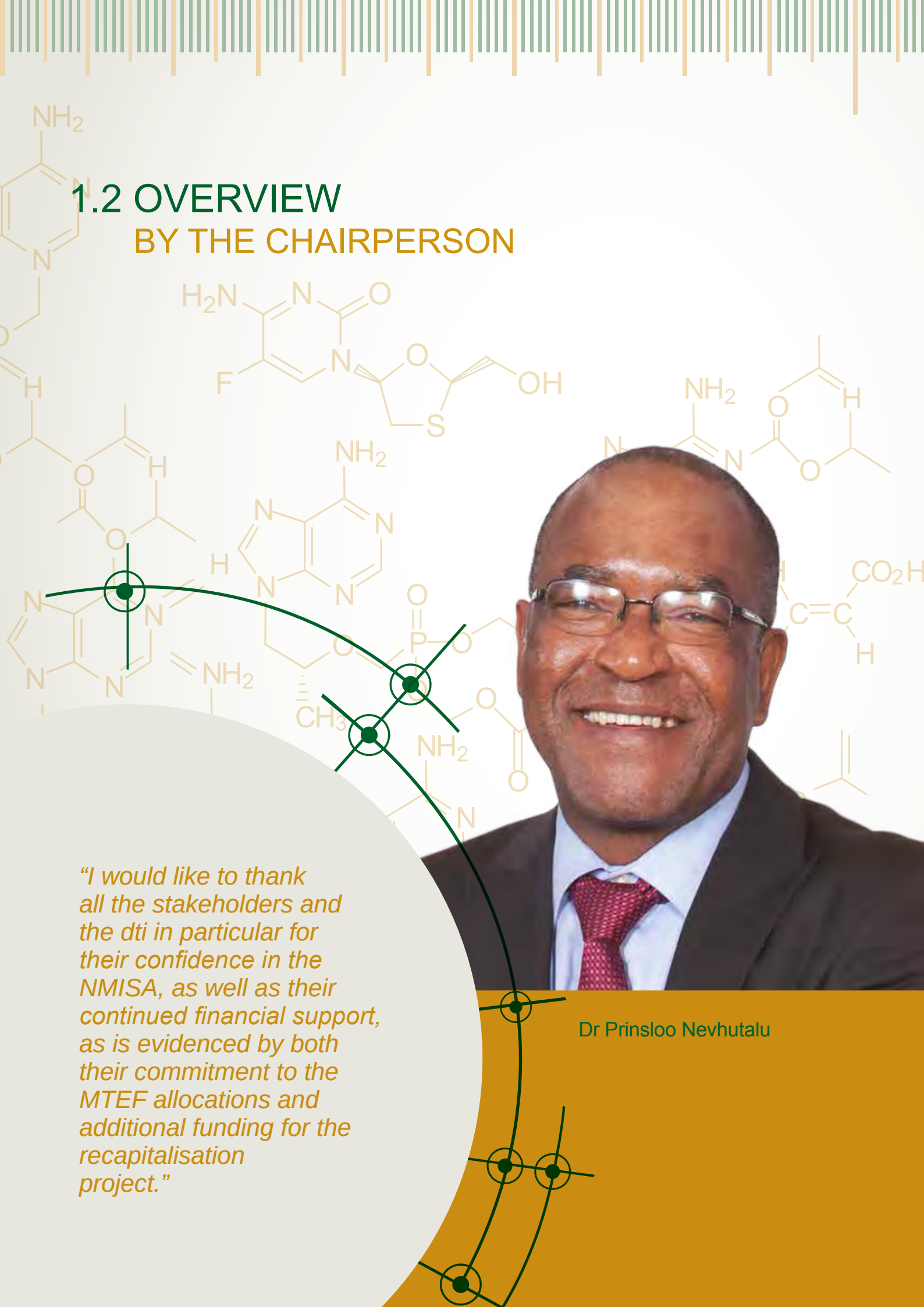
Recognising that South Africa's economic development success is inextricably linked to the broader African continent, the dti's technical infrastructure institutions, have been playing a leading role in the development of the African quality infrastructure. The leading role has been highlighted by the successful establishment of the Pan African Quality Infrastructure (PAQI). The PAQI was inaugurated on 30 August 2013 by the African Union Commission, Director for Trade and Industry.

The NMISA has continued to play a pivotal role in the metrology developments at both SADC through the SADCMET and the Intra Africa Metrology System (AFRIMETS) at continental level. These developments ensure that the technical barriers to Intra-Africa trade are removed.

I would like to congratulate the NMISA on a successful 2013/14 financial year and look forward to its contribution to the dti deliverables in line with the IPAP and the broader South African economy in 2014/15.

Dr Rob Davies
Minister of the Department of Trade and Industry

1.2 OVERVIEW
BY THE CHAIRPERSON



"I would like to thank all the stakeholders and the dti in particular for their confidence in the NMISA, as well as their continued financial support, as is evidenced by both their commitment to the MTEF allocations and additional funding for the recapitalisation project."

Dr Prinsloo Nevhutalu

Following the reorganisation process that took place in 2012/13, the Institute embarked on a process of normalisation and stabilisation to continue providing the South African industry, environmental, health and safety sectors with fit-for-purpose measurement standards and measurements. The Institute continued its mandate of keeping and maintaining the national measurement standards and units at an acceptable international standard and disseminating traceability to the South African industry.

A major highlight of the period under review was the filling of the Chief Executive Officer position, left vacant following the resignation of Dr Molefi Motuku in 2012. Mr Ndwakhulu Mukhufhi was appointed CEO in September 2013. I would like to welcome Mr Mukhufhi to the NMISA. We are looking forward to your contribution in leading the NMISA to greater heights. I would also like to thank Mr Benjamin van der Merwe for his hard work and dedication while serving as acting CEO until the appointment of the new CEO.

The period under review also marked the end of the term of the NMISA Board and this necessitated the appointment of new Board Members. In the interest of continuity and stability, the majority of the Members of the Board, including the Chairperson, were reappointed. Only three new Members were appointed and one independent audit and risk committee member. I would like to thank the Minister on behalf of the Members of the Board for showing confidence in us. The governance structure was further strengthened by the appointment of Mr Charles Kgoale to the position of Manager of Compliance and Corporate Governance/ Company Secretary in October 2013.

This, in conjunction with the other governance functions established during the previous period under review, ensured that the NMISA once again received an unqualified audit opinion. I would like to thank all Members of staff for their hard work and diligence in ensuring that this achievement was attained in the current fiscal climate of stringent compliance and corporate governance requirements.

As part of the NMISA's mandate to keep, maintain and realise measurement standards for South Africa, international participation in various forums and committees and their technical activities is necessary. The importance of such action is to prove the international equivalence of South Africa's measurement standards and, in so doing, assist in breaking down technical barriers to trade. The International Committee for Weights and Measures (CIPM) defines the international system of units and provides governance for the International Bureau of Weights and Measures (BIPM). In May 2013, Dr Wynand Louw from the NMISA was elected to this prestigious committee and became the first African-born member of the Committee since its inception in 1875.

At a regional level, the NMISA continued contributing to the development of the SQAM infrastructure, with the emphasis on metrology, in the SADC and the African region as a whole. The NMISA, via the TID Division, is currently serving as a secretariat for both the Southern African Development Community Cooperation in Measurement Traceability (SADCMET) and the Intra-Africa Metrology System (AFRIMETS). The NMISA also participated in the establishment of the Pan African Quality Infrastructure (PAQI).

Another highlight of the period under review, was the attainment of certification to ISO 14001 and OHSAS 18001, in line with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and related regulations. Technically, the NMISA adheres to a total quality management system and almost all of its laboratories are accredited to ISO/ IEC 17025. The laboratories involved in CRM production are accredited to ISO Guide 34 and those involved in proficiency testing to ISO/IEC 17043.

Progress was made with the implementation of the NMISA's recapitalisation projects, which are aimed at dealing with the major challenge presented by ageing infrastructure. The appointed project officers are in place and the appointment of a transaction advisor on a detailed feasibility study in line with Treasury Regulation 16, is currently underway. Most of the capital equipment acquired, utilising the R50 million (2013/14) allocation for recapitalisation, are in the process of being delivered and will contribute positively to the development and maintenance of the NMS and its dissemination to industry. Despite some delays in the appointment of said transaction advisor, the process is progressing. It is envisaged that the feasibility study will be concluded by June 2015.

Despite a constrained economic environment faced by our clients, who were forced to extend their calibration schedules, the NMISA continued to perform and deliver on its core mandate. During 2013/14, ten new NMSs in the fields of mass, ionising radiation and electricity were gazetted to bring the number of gazetted NMSs to 52.

The number of calibration and measurement capabilities accepted by the international Key Comparison Database (KCDB) increased to 386.

One of the major lows of the period under review was the loss of experienced and skilled staff Members as a result of resignations, retirement and death. This resulted in the organisation experiencing challenges to meet targets that are related to a skilled and competent workforce. The number of PhD and MSc degrees in the organisation totalled 10 and 32 respectively, falling just short of the respective targets of 12 and 34. The NMISA is doing its utmost via the internal skills development programmes and bursary project to address this challenge. During the 2014/15 financial year, more emphasis will be placed on the recruitment and development of young scientists and metrologists, in order to address skills requirements.

In closing, I would like to thank all the stakeholders and the dti in particular for their confidence in the NMISA, as well as their continued financial support, as is evidenced by both their commitment to the MTEF allocations and additional funding for the recapitalisation project. With your valued support, the NMISA will continue its contribution towards national priorities, as is outlined in the IPAP and the NDP. We are looking forward to a successful 2014/15 and the implementation of the recapitalisation projection to take the NMISA to new heights.

Dr Prinsloo Nevhutalu
Chairperson
NMISA
31 July 2014

1.3 SUBMISSION TO THE EXECUTIVE AUTHORITY

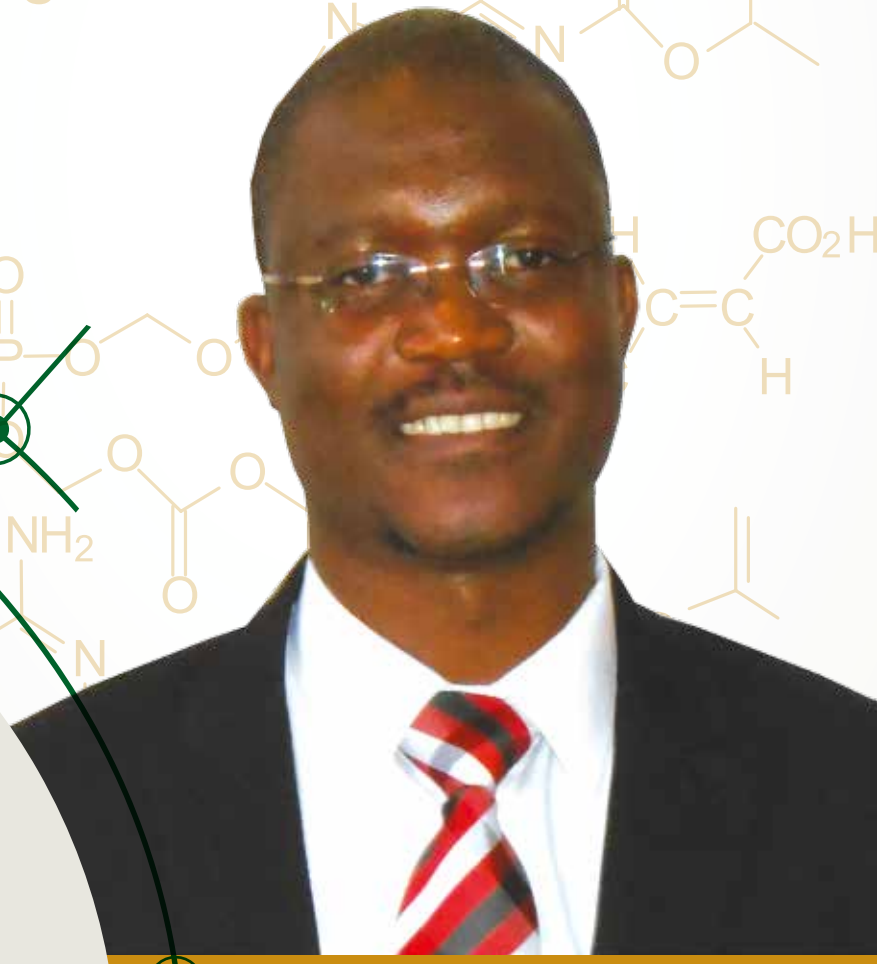
It is hereby certified that this Annual Report:

- was prepared by the management of the NMISA under the guidance of the Board and the Board Chair, Dr Prinsloo Nevhutalu; and
- that it accurately reflects the performance outputs that the NMISA achieved, given the resources made available in the budget for 2013/14.

Prepared and compiled by the NMISA Directors as well as Compliance and Corporate Governance:

- **Dr Rob Davies**
  Executive Authority
- **Dr Prinsloo Nevhutalu**
  Accounting Authority
- **Mr Ndwakhulu Mukhufhi**
  Chief Executive Officer
- **Ms Irene Mathatho**
  Executive Director: Finance and Corporate Services
- **Dr Wynand Louw**
  NMISA Director of Research and Technical Development
- **Mr Charles Kgoale**
  NMISA Manager of Compliance/Corporate Governance
- **Ms Zakithi Msimang**
  NMISA Director of Ionising Radiation
- **Mr Benjamin van der Merwe**
  NMISA Director Physical Metrology
- **Ms Natasha Nel-Sakharova**
  NMISA Director Electricity and Magnetism
- **Ms Jayne de Vos**
  NMISA Director Chemistry

1.4 INTRODUCTION BY THE CHIEF EXECUTIVE OFFICER



Mr Ndwakhulu Mukhufhi

"I was pleased that the team had embraced my motto, 'Fly with your strength and let others complement you on your weaknesses,' with an eagerness that contributed to the strengthening of teamwork and cooperation. Our successes are built on our people and I would like to thank all our Members of staff for their dedication and commitment."

The NMISA was established in terms of the Measurement Units and Measurement Standards, Act, 2006 (Act No. 18 of 2006) (The Measurement Act). The period under review was characterised by the Organisation's continued performance efforts towards achieving its mandate, as defined by the Act.

It gives me great pleasure to present my first Annual Report as Chief Executive Officer of NMISA. When I was appointed in September 2013, I was delighted to be welcomed by a team of dedicated and hardworking professionals in both technical and support services. Within a week of assuming my position, I felt as though I had been part of the team for more than a year. I was pleased that the team had embraced my motto, "Fly with your strength and let others complement you on your weaknesses", with an eagerness that contributed to the strengthening of teamwork and cooperation.

Despite the continued difficult economic climate, 2013/14 was a successful year for the NMISA – South Africa's home of measurement standards and measurement traceability and a leading national measurement Institute. We continued to develop and apply the most accurate measurement standards and enhance our metrological outputs.

World class metrology is firmly at the core of NMISA. This is evident in the number of peer-reviewed journal publications; presentations at national and international conferences; our participation in national and international committees; and the continual increase in South Africa's measurement capabilities.

Our activities focused on NMISA's strategic goals and objectives, the dti's objectives, the Industrial Policy Action Plan (IPAP) and government's 12 national outcomes. NMISA worked closely with the other dti technical infrastructure (TI) Institutes to establish comprehensive standards, quality assurance, accreditation and metrology (SQAM) environment that supports the "locking out" of unsafe and poor quality imports and "locking in" access to increasingly demanding export markets.

The availability of skilled metrologists remains a challenge. During the period under review, we concentrated on training in the scarce and critical skills in metrology, so as to enable us to continue meeting our mandate. We saw the graduation and appointment of the first few students to be taken in as NMISA bursars. The highlight of this was the graduation of Nontete Nhlapo, who obtained her doctor philosophiae (PhD) from the University of Pretoria. Dr Nhlapo's dissertation is entitled: "TGA-FTIR study of volatile corrosion inhibitor model systems". At NMISA, we proudly congratulate Dr Nhlapo and welcome her as an employee in the Chemistry Division.

To broaden the pipeline of candidates for metrologist positions, we started engaging with universities with a view to implement metrology modules and courses at university level. Talks are at an advanced stage with the University of Johannesburg, which is interested in introducing a module in accurate measurements. A course outline, with intended learning outcomes, has already been developed in the areas of mass; length; time; temperature; electric current; amount of substance; and luminous intensity.

Key achievements

A total of 52 National Measurement Standards (NMSs) were gazetted during the first quarter of 2013/14 and have been maintained successfully. In support of accredited calibration laboratories and the international acceptance of South African calibration and test certificates, a total of 386 calibration and measurement capabilities (CMCs) were published on South Africa's behalf on the international database.

NMISA adheres to a Total Quality Management System (TQMS) that is technically underpinned by the accreditation of almost all laboratories to ISO/IEC 17025. The laboratories involved in CRM production are accredited to ISO Guide 34, and those involved in proficiency testing to ISO/IEC 17043. During the 2013/14 financial year, these organisations attained certification to ISO 14001 and OHSAS 18001, in line with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and related regulations.

In support of quality of life and, more in particular, health and safety and green energy, 15 new certified reference materials (CRMs) and critical reference measurements were developed to help safeguard the food we eat and the environment in which we live. A total of 210 higher order CRMs were supplied to clients such as the Department of Health's forensic laboratories, law enforcement agencies, producers of medical and industrial gas, environmental monitoring agencies, etc.

Research outputs from NMS and CRM development increased substantially, as did collaboration with HEIs and other research institutions, while 20 scientific papers were published in scientific journals. The measurement capabilities and activities of NMISA were further

disseminated via 71 oral and poster presentations at conferences and workshops.

In summary, NMISA met eight of its nine main technical key performance indicators (KPIs) and reached 95% on the only KPI not met (income generated through calibration). On the NMISA balanced score card, the organisation met and exceeded six of the seven KPIs in the stakeholder and customer perspective. The only KPI not met in this perspective is the dissemination of the NMS and measurement capabilities, measured via revenue generated from calibration services. In total, R10 083 202 was raised instead of the target amount of R10 600 000, representing 95% of the target.

On the internal organisation perspective (learning and growth perspective), NMISA met five of the seven KPIs. The organisation made 88% progress on the unmet targets. The lowlight in this perspective was the loss of qualified staff Members holding MSc and PhD degrees. At the end of the period under review, the organisation employed 10 and 32 staff Members with PhD and MSc degrees respectively. Despite the appointment of two employees with PhD degrees and six employees with MSc degrees, we had four PhD and three MSc terminations, due to various reasons, including resignations, retirement and death.

The period under review saw NMISA meeting five of the seven KPIs in the financial and business perspective of the organisational score card. The highlight in this perspective was the attainment of an unqualified audit opinion.

Recapitalisation/infrastructure development

NMISA faces the challenge of aged infrastructure, as well as fast developing international measurement system challenges. An additional budget was approved for NMISA by Cabinet in the MTEF allocation. This was on the recommendation of the Minister's Budget Committee and the funds will be used to improve national measurement standards. Total amounts of R50 million and R100 million were allocated for 2013/14 and 2014/15 respectively. A project officer was appointed for the recapitalisation project and transaction advisors are currently being appointed. A procurement plan was submitted for the upgrade of the instrumentation for the NMSs, which will be diligently adhered to in 2014/15.

International and regional relations

South Africa became a signatory to the Metre Convention in 1964. The convention allows NMISA to play a key role in the establishment of measurement traceability and organisation's international equivalence, as the Institute is placed at the interface between the national and international systems. The expanding global trade and pressure to eliminate technical barriers to trade (TBTs) create a constant demand for greater accountability and demonstrated competence in NMIs.

Via our involvement and participation in the Southern African Development Community Cooperation in Measurement Traceability (SADCMET) and in the Intra-Africa Metrology System (AFRIMETS), NMISA continues to play a leading role in the development of metrology infrastructure in Africa – particularly in support of South Africa's immediate neighbours in the SADC. A sound measurement structure is critical to the successful implementation of regional free trade agreements and the elimination of TBTs.

Acknowledgements

Our successes are built on our people and I would like to thank all our Members of staff for their dedication and commitment. In conclusion, I would like to express my gratitude to the NMISA Chairperson and Board of Directors, NMISA's executive management, the dti and all stakeholders for their continued support and feedback. We are looking forward to an exciting and successful 2014/15.

Mr Ndwakhulu Mukhufhi
Chief Executive Officer
NMISA

31 July 2014

1.5 VISION, MISSION AND VALUES STATEMENTS

Vision	To be a centre of measurement excellence, inspired to consistently deliver outstanding, innovative and internationally-comparable measurement solutions that support the country's trade, people's quality of life and enable the protection of the environment.
Mission	To keep, maintain and develop national measurement standards and units, and to disseminate traceability in the South African industry.
Values	Measurement excellence, social responsibility, economic prosperity and good governance.

1.6 LEGISLATIVE MANDATE

South Africa is a signatory to the Metre Convention, a treaty dating back to 1875. In terms of this Convention, the International Bureau of Weights and Measures (BIPM) was established to act in matters concerning world metrology, particularly with regard to the demand for measurement standards of ever-increasing accuracy, range and diversity, as well as to address the need to demonstrate equivalence between national measurement standards. The International System of Units (SI) was also established in terms of the Metre Convention and is overseen by the International Committee for Weights and Measures (CIPM).

South Africa signed the CIPM Mutual Recognition Arrangement (MRA) in 1999. The CIPM MRA was reached in response to a growing need for an open, transparent and comprehensive scheme to provide users with reliable quantitative information on the comparability of national metrology services, as well as to provide the technical basis for wider agreements negotiated with regard to international trade, commerce and regulatory affairs. It forms the basis for the international acceptance of national measurement standards and for calibration and measurement certificates issued by national metrology Institutes (NMIs).

The National Metrology Institute of South Africa (NMISA) was established in terms of the Measurement Units and Measurement Standards Act, 2006 (Act No. 18 of 2006) (The Measurement Act) to represent South Africa at the Metre Convention and its organs, as well as to enact its obligations.

As the custodian of the NMS in accordance with the Measurement Act, NMISA therefore develops and maintains primary and secondary standards (chemical and physical quantities) for South Africa and compares those standards to international standards, in order to determine their equivalence and ensure global comparability. These standards are disseminated to the South African industry via a range of services and products and, in the event of a measurement dispute, reference analyses are provided to ensure conformity.

To provide for the use of measurement units of the International System of Units (SI) and specific other measurement units; to provide for the designation of the national measurement units and standards; to provide for the keeping and maintenance of the national measurement standards and units; and to provide for the establishment and functions of the National Metrology Institute of South Africa (NMISA).

1.7 OVERVIEW OF NMISA

1.7.1 Organisational Structure

NMISA is a Type 3A public entity, managed by a Chief Executive Officer (CEO), supported by an executive management team and governed by the NMISA Board:

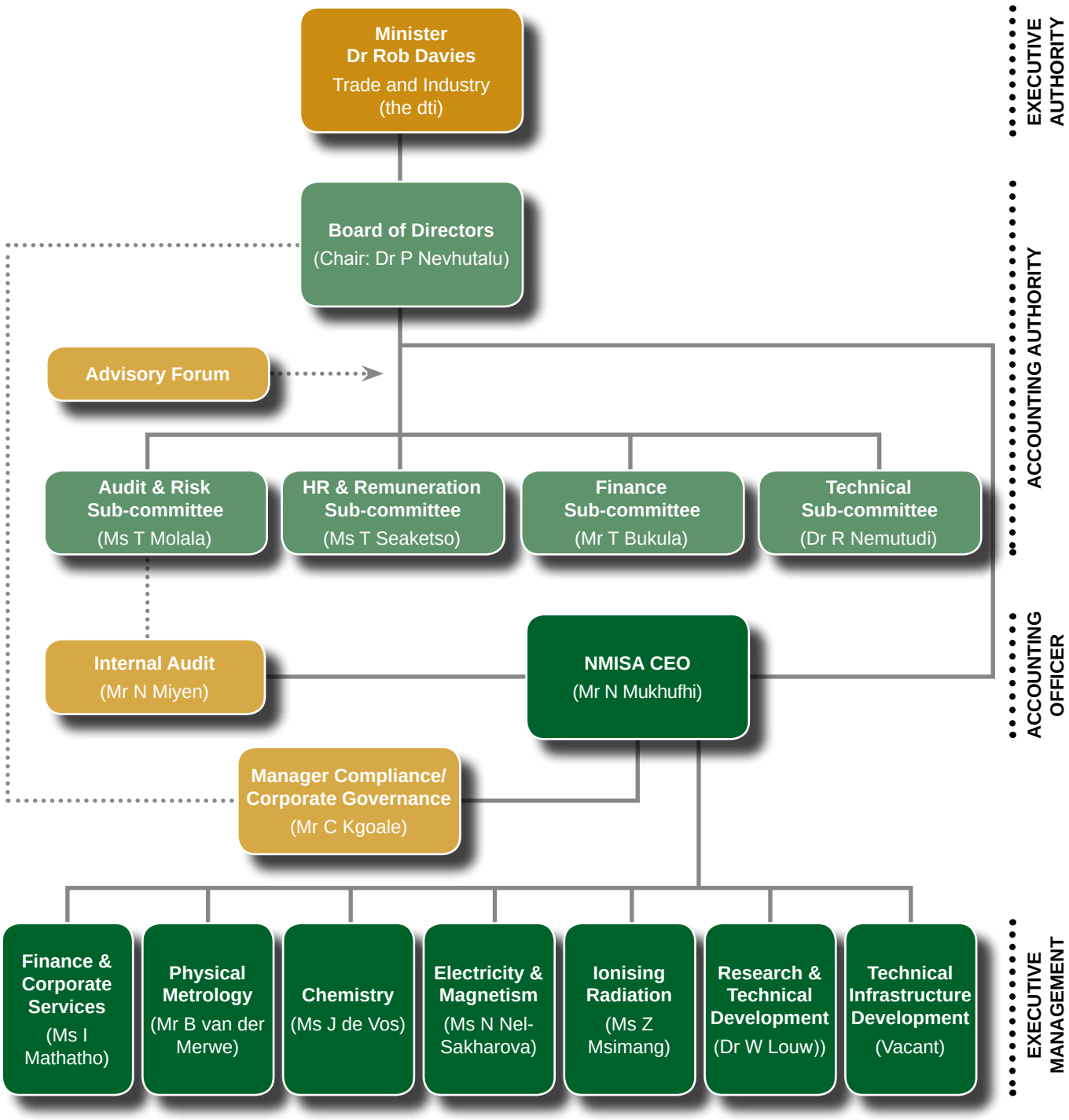


Figure 1.7.1: Organisational Structure

GOAL 1	Ensuring that South Africa maintains national measurement standards; and demonstrating their comparability to other national and international standards and measurements.
GOAL 2	Building and maintaining an internationally recognised national metrology system as foundation for the South African measurement system.
GOAL 3	Strengthening the metrology system is a key component of the technical infrastructure; and ensuring that it is aligned with international best practice.
GOAL 4	Providing essential support to South African enterprises competing in a fast-paced global economy.
GOAL 5	Providing essential support for public policy objectives, with regard to measurement compliance issues in terms of health, safety and the environment.

Table 1.7.2. Strategic Goals

1.7.2 Strategic Outcome Oriented Goals

The National Metrology Institute of South Africa (NMISA) is guided overall by five goals as detailed in Table 1.7.2 above.

1.7.3 Service Delivery Environment

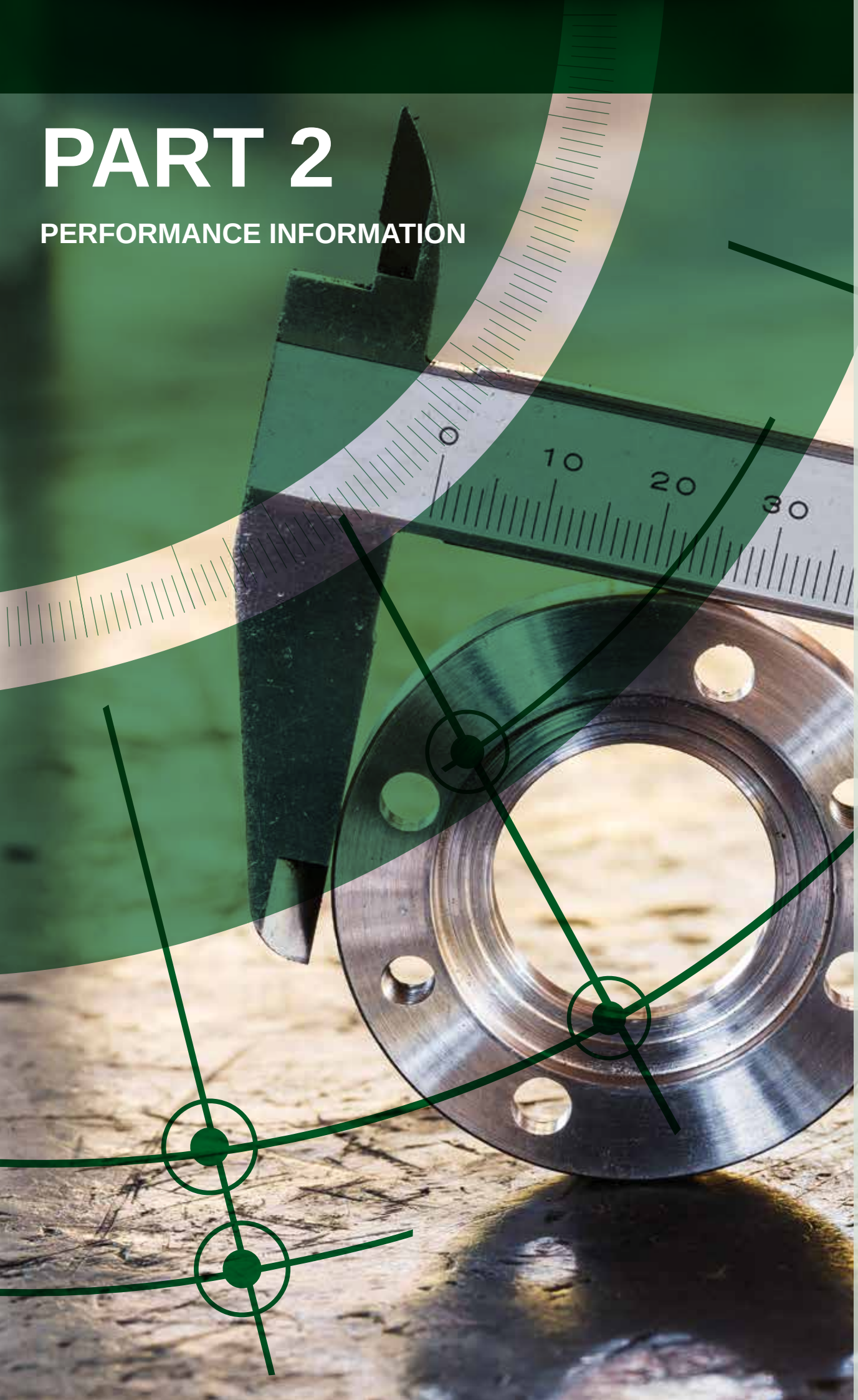
As one of the dti's four Technical Infrastructure (TI) Institutes, the NMISA's activities are crucial for the success of the other TIs and they support national programmes, such as the Industrial Policy Action Plan (IPAP). Standardisation, metrology, conformity assessment and accreditation are the key components in the implementation of free trade agreements between countries/economic trade blocks.

The NMISA also plays a leading role in the development of metrology infrastructure in Africa, especially in support of South Africa's immediate neighbours in the SADC. A sound measurement structure is crucial to the successful implementation of regional free trade agreements and the elimination of TBTs. This role is emphasised in the dti's strategic goals and is South Africa's contribution to the establishment of harmonised regional standards.

Participation in international activities of the Consultative Committees (CCs) and RMO Technical Committees (TCs) is imperative. These interactions serve to benchmark South Africa's capability to compete in measurement equivalence and impacts directly on the NMISA's ability to disseminate traceability to the country.

PART 2

PERFORMANCE INFORMATION



BOARD MEMBERS

Mr Thembani Bukula
CHAIR OF THE FINANCE COMMITTEE

Ms Tshidi Molala
CHAIR OF THE AUDIT AND RISK COMMITTEE

Dr Prinsloo Nevhutalu
BOARD CHAIRMAN

Dr Rudzani Nemutudi
CHAIR OF THE TECHNICAL COMMITTEE

Ms Tumelo Seaketso
CHAIR OF THE HR AND REMUNERATION COMMITTEE

Adv Catherine Letele
BOARD MEMBER

Mr Tshokolo Nong
BOARD MEMBER

Ms Jabu Mogadime
BOARD MEMBER

Dr Tshenge Demana
BOARD MEMBER

Dr Cleopas Sanangura
BOARD MEMBER

EXECUTIVE MANAGEMENT

Mr Charles Kgoale
MANAGER OF COMPLIANCE AND CORPORATE GOVERNANCE/COMPANY SECRETARY

Dr Wynand Louw
DIRECTOR RESEARCH AND TECHNOLOGY DEVELOPMENT

Mr Ndwakhulu Mukhufhi
CHIEF EXECUTIVE OFFICER

Ms Irene Mathatho
EXECUTIVE DIRECTOR FINANCE AND CORPORATE SERVICES

Ms Jayne De Vos
DIRECTOR CHEMISTRY

Ms Zakithi Msimang
DIRECTOR IONISING RADIATION

Ms Natasha Nel-Sakharova
DIRECTOR ELECTRICITY AND MAGNETISM

Mr Benjamin van der Merwe
DIRECTOR PHYSICAL METROLOGY

2.1 NMISA SUMMARY OF FINANCIAL PERFORMANCE

Table 2.1.1 Revenue Collection

Sources of Revenue	Main Budget Allocation R'000	Actual Amount Collected R'000	Over/Under collection R'000
Government Grant	145 942	145 942	-
Services Rendered	10 600	10 083	517
Interest Received	1 261	3 569	(2 308)
Total	**157 803**	**159 594**	**(1 791)**

Revenue from services rendered – External revenue was affected by the economic downturn experienced in other countries that NMISA does business with.

Interest received – The R50 million received during the financial year under review for the NMISA Recapitalisation Project resulted in an increase in interest received from the bank.

Table 2.1.2 Divisional Expenditure

Division	Main Budget Allocation R'000	Actual Amount Collected R'000	Over/Under collection R'000
Chief Executive Officer	7 500	6 805	695
Finance and Corporate Services	87 799	40 715	47 084
Chemistry	16 408	14 384	2 024
Physical Metrology	12 857	10 302	2 555
Electricity and Magnetism	17 041	12 266	4 775
Ionising and Radiation	8 133	4 976	3 157
Research and Technical Development	5 785	5 672	113
Technical Infrastructure Development	2 280	3 294	(1 014)
Total	**157 803**	**98 414**	**59 389***

* The under-expenditure of R59 million is due to the R50 million received during the period under review towards the NMISA Recapitalisation Project and the R9 million is part of the commitments for this financial period. The project officers were appointed during the period under review to kick-start the project and plans are in place to utilise the funds during the 2014/15 financial year.

2.1.1 NMISA Strategic Objectives

As the custodian of the NMS in accordance with the Measurement Act, NMISA develops and maintains primary and secondary standards (chemical and physical quantities) for South Africa and benchmark those standards against other national and international standards, in order to determine their equivalence and ensure global comparability. These standards are disseminated to the South African industry via a range of services and products and, in the event of a measurement dispute, reference analyses are provided to ensure conformity.

Table 2.1.3 Strategic Objectives

1	Keep and maintain the equipment necessary to achieve national measurement standards and certify reference materials
2	Upgrade the existing measurement standards and develop new measurement standards and reference materials in line with the requirements of commerce and industry
3	Establish confidence in the accuracy of the national measurement standards via suitable and documented verification processes
4	Disseminate traceability and measurement expertise and services to South African commerce and industry by means of calibration; measurement or analysis; certified reference materials; appropriate technology; and skills transfer
5	Establish and maintain the necessary expertise and competence according to internationally-accepted standards
6	Recapitalise and modernise the NMISA to ensure that the NMS supports international trade, health, as well as environmental and safety requirements
7	Participate and represent South Africa regionally and internationally with reference to traceability and measurement issues and maintain close links with the CIPM and associated activities of the Metre Convention

To deliver on its mandate, NMISA is guided overall by seven strategic objectives that are aligned with its goals as detailed in Table 2.1.3 above.

2.1.2 Description of Programmes

NMISA manages its technical activities via four technical divisions, namely Physical Metrology (PM), Electricity and Magnetism (EM), Ionising Radiation (IR) and Chemistry (CM), which are assisted by the cross-cutter divisions of Research and Technology Development (RTD) and Technology Infrastructure Development (TID), and supported by Finance and Corporate Services. The divisional structure is depicted in Figure 2.1.1.

NMISA adheres to a total quality management system and almost all the laboratories are accredited to ISO/IEC 17025. The laboratories involved in CRM production are accredited to ISO Guide 34 and those involved in proficiency testing to ISO/IEC 17043. The environmental health and safety (EHS) practitioner, utilising supporting structures, handles all matters relating to the health and safety of staff Members, such as ensuring a safe working environment; identification of laboratory and workplace hazards/aspects; ensuring environmental sustainability; training of staff in safety awareness; inspections; and compliance with the relevant legislation. NMISA is also officially certified to ISO 14001 and OHSAS 18001.

Physical Metrology (PM)

Physical measurements are fundamental to the manufacturing of high-quality goods and services and the construction of infrastructure. The Physical Metrology Division is the source of measurement traceability for physical measurement parameters, not only in South Africa, but also in sub-Saharan Africa. To maintain this status and in support of IPAP, PM will modernise its out-of-date facilities with a special focus on providing fit-for-purpose measurement standards in mass and related quantities (volume, pressure, flow, viscosity, force, torque and hardness), acoustics, ultrasound, vibration and length measurements. The focus for 2013/14 was on supporting the automotive and transport equipment manufacturing sectors.

Electricity and Magnetism (EM)

The Electricity and Magnetism Division ensures accuracy and traceability for all electrical, temperature, light transmission, radio frequency, time and frequency, fibre optics and non-ionising radiation measurements in South Africa. From ubiquitous quantities, such as temperature, to the rapidly advancing technologies of high-speed digital communication, the measurement expertise maintained by the division is of vital importance to the South African economy.

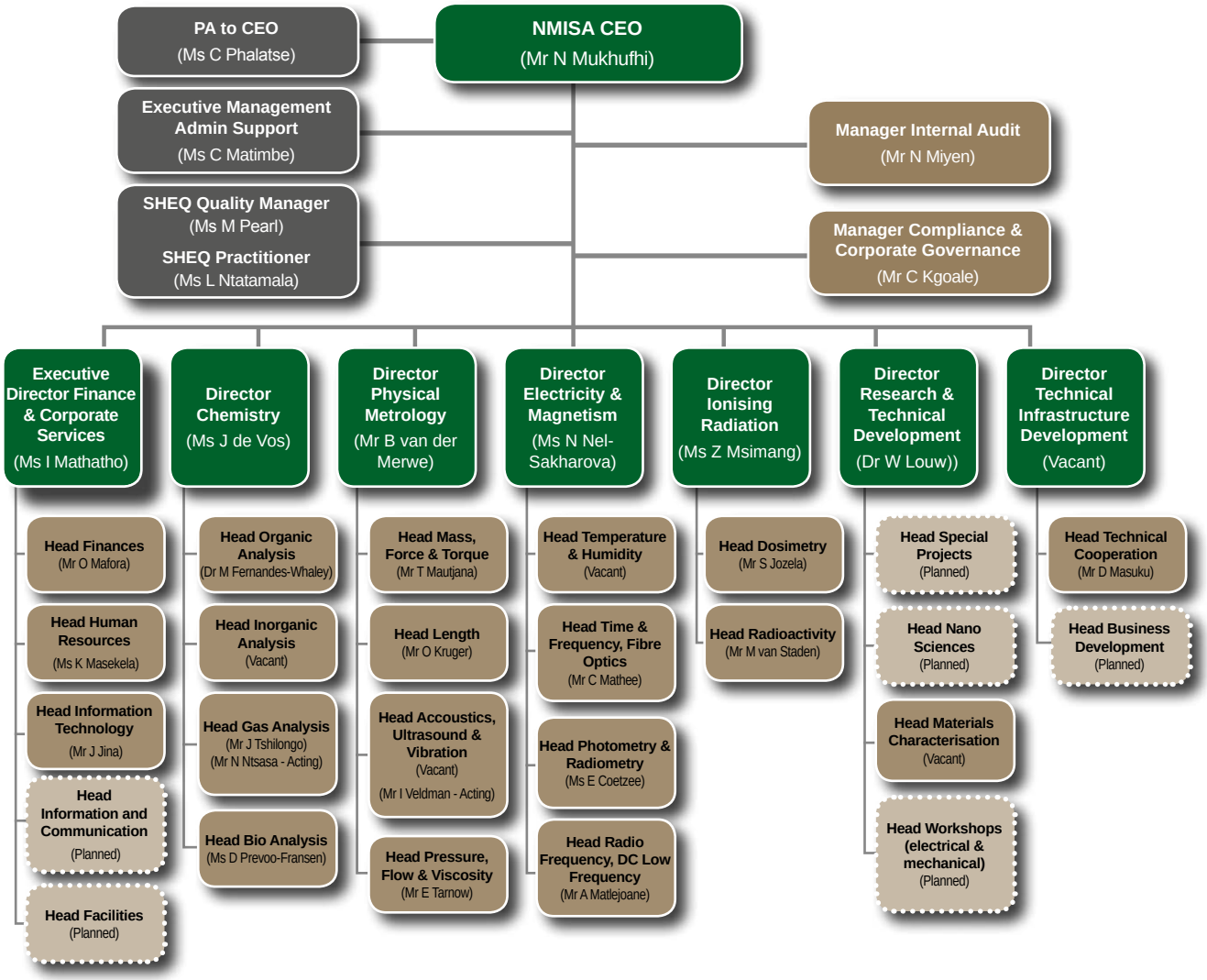


Figure 2.1.1 NMISA Organisational Structure

The division strives to maintain a broad spectrum of capabilities and is active in the fields of optical radiation, fibre optics, time and frequency, radio frequency and DC/ low frequency electrical, temperature and humidity. As measurement infrastructure in physical metrology is well developed in South Africa, dissemination of traceability is dominated by the calibration of measurement standards for commercial calibration laboratories and regional NMIs, rather than the calibration of instruments directly for industrial users.

Ionising Radiation (IR)

The Ionising Radiation Division, comprising the Dosimetry Standards (DS) and Radioactivity Standards (RS) sections, provides traceability and specialised measurement services for users of radiation products and techniques in both the country and the region. The division enables accurate, traceable measurements of all levels of radioactivity and radiation doses, to support the nuclear industry, trade, energy efficiency, as well as environmental, health and safety requirements.

The main priorities are the development and upgrading of standards in radiation therapy, including brachytherapy, diagnostic radiology, radiation protection and radio analytical services. The division organises regional comparisons to harmonise measurements in Africa, to assist nuclear medicine departments and plans to, with the IAEA as partner, establish a national audit programme that focuses on linear accelerators in radiation therapy centres to ensure that the correct doses are administered to cancer patients.

Chemistry (CM)

In support of measurements for quality of life and, especially consumer health and safety and green energy, certified reference materials (CRMs), reference measurements and proficiency testing schemes are being developed. The

Chemistry Division's focus is on supporting agro-processing (food exports and locally consumed items) to meet the ever-stricter regulatory limits on pesticides, toxic elements, such as dioxins and mycotoxins, as well as other hazardous substances. Measurement techniques and traceable measurements will also be made available to commercial laboratories that provide industry with reliable measurement values, so as to ensure the quality and international acceptance of their measurement results. The development of these measurement techniques and traceability is achieved via extensive collaboration with academia, science Institutes and other NMIs. It will also serve to enrich the current scarce skills base of the analytical sciences in South Africa.

Research and Technology Development (RTD)

A strong research infrastructure in measurement science is critical to the enhancement of the NMS, as well as for the successful initiation and execution of innovation and technical development programmes. NMISA is establishing long-term multidivisional research programmes that will support measurement and product development for national innovation projects in consumer protection, nanotechnology, biofuels, advanced materials and ICT.

Research in NMISA is conducted at two distinct levels; namely experimental development of national measurement standards and methods of analysis, and cross-cutter research for the development of new standards, as a contribution to national priority projects and/or to develop measurement equipment in support of rural development programmes. Stronger research and development cooperation will be fostered in both national and international science Institutes, as well as in other research funding opportunities.

Technical Infrastructure Development (TID)

Technical Infrastructure Development is focused on increasing the impact of accurate measurement at all levels of society and manages the relationship and obligations of NMISA within the Metre Convention and related international bodies (as stipulated in the Measurement Act). The Division also strives to develop new business by means of assistance to major industries and, in collaboration with the Small Enterprise Development Agency (SEDA), provides targeted assistance to SMEs, especially automotive component manufacturers, to meet the technical specifications as preferred suppliers. Technical cooperation with the metrology Institutes of the other BRICS countries is also key to improve on issues of joint concern, such as to provide accurate measurement for biofuels, nanotechnology and metals fabrication. Specific metrology development projects are also planned in conjunction with other NMIs in the region to assist intra-regional trade.

Finance and Corporate Services (FCS)

Finance

The Finance Division is responsible for the overall financial management of NMISA funds, including planning and budgeting. The division ensures that the operational and capital expenditure is in line with the prescripts of the Public Finance Management Act, 1999 (Act No. 1 of 1999) (PFMA) and related regulations. The primary goal of finance is to maximise or increase shareholder value. NMISA faces old infrastructure and fast developing international measurement system challenges and, with effect from the 2013/14 financial year, NMISA has realised a significant growth of transfer funds from the national fiscus to address its Recapitalisation Project. This additional responsibility is facilitated by FCS.

Human Resources

The Human Resources Section ensures a competent and sustainable workforce. The staff complement will continue to grow parallel to the drive to raise the qualification profile of the Institute, so as to ensure that it is equipped to meet the increasingly more stringent measurement requirements, both locally and internationally. The organisation needs to invest significantly in skills development, while building a pool of talent to address future skills needs. The revised Human Capital Development Plan indicates an aggressive increase in the intake of students and graduates into the undergraduate bursary programme, studentship (postgraduate bursary programme) and the internship programme. The Plan also emphasises continued support for current staff Members to enhance their qualifications and gain technical experience by means of exchange and secondment projects with other NMIs.

Supply Chain Management

Supply Chain Management (SCM) is the procurement of goods and services. It covers areas such as demand management, acquisition management, logistics management, disposal management and risk management. SCM is responsible for the design, planning, execution, control and monitoring of supply chain activities, as well

as synchronising supply with demand and measuring performance. SCM draws heavily from the areas of operations management, logistics, procurement and information technology, and strives for an integrated approach to provide NMISA with a streamlined and cohesive operational platform. The division administers the tender process in line with the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000) (PPPFA).

Information Technology (IT)

Information Technology includes, but is not limited to providing hardware, software, services, as well as supporting infrastructure to manage and deliver information for NMISA, using voice, data and video.

Information, Communication and Facilities

Information and Communication ensures continued dissemination of information both internally and externally, while cooperating with HR and IT to position NMISA as an employer of choice. The Facilities Department focuses mainly on the stability of the internal electricity supply, air-conditioning and general maintenance.

Office of the CEO

Internal Audit (IA)

Internal Audit is an independent function that reports to the Executive Authority (the Board) and to the CEO. Internal Audit focuses on reviewing the adequacy of internal controls throughout the entity, with particular emphasis on those that have financial implications. In line with government priorities, audits on performance information constitute one of the key focal areas. The emphasis is also placed on providing assurance with regard to the integrity of both operational and financial information, such as organisational performance information and financial reporting.

SHEQ

Environmental health and safety, as well as health and quality ensure the proper adherence to, and implementation of safety and quality standards. The quality practitioner coordinates and manages the accreditation of laboratories to ISO/IEC 17025 and 17043 and Guide 34, as well as with EXCO, and also ensures adherence to quality management systems. The EHS coordinator and practitioner manages the certification of NMISA to ISO 14001 and OHSAS 18001.

Compliance and Corporate Governance (CCG)

Compliance and Corporate Governance includes the Company Secretary and the Board at this point in time, although these two functions should be separate.

Compliance and Corporate Governance ensures adherence to local, national and international laws, as well as the requirement that the entity's employees show integrity and honesty in all their dealings. Risk management and internal controls are therefore embedded throughout, thus assuring the accuracy and validity of reports and certificates that the entity provides to customers. The CCG's role is closely linked with that of the FCS Division.

Compliance coordinates and manages interaction with the Board and ensures compliance with the relevant Acts and regulations that govern NMISA.

NMISA structures collectively contribute to the main programmes of NMISA.

The NMISA supports the South African mining industry

South Africa is estimated to have the 5th largest mining sector in terms of GDP value and creates over one million jobs in South Africa.

The National Laboratory Association (NLA) with the support of the NMISA is developing a proficiency testing scheme for local test laboratories, to test the exposure of especially deep-shaft coal miners to respirable dust. This precautionary measure is required to protect the miners from the possible contraction of silicoses, a dangerous lung-disease that is caused by alpha quartz silica in dust.

*** Information from South African Chamber of Mines**

2.2 PURPOSE OF THE PROGRAMMES

The NMISA underpins all accurate measurements for the country and the region and provides for the international acceptance of local measurements. This, in turn, allows for the acceptance of export products on overseas markets, ranging from commodities and food products to manufactured goods. In addition, metrology is a vital ingredient in safeguarding the populace against contaminated and dangerous foodstuffs, manufactured products not meeting local specifications, contaminated water, other environmental hazards and inaccurate health measurements. It also plays an important role in law enforcement. The NMISA works closely with the dti and other government departments to improve the competitiveness of the South African industry in support of national strategic goals. Assistance to the informal sector includes special projects to highlight the role that accurate measurement plays in the improvement of all products.

The NMISA's main responsibilities are to ensure that South Africa maintains national measurement standards and demonstrates their comparability to other national and international standards and measurements; to build and maintain an internationally recognised national metrology system as foundation for the South African measurement system; to strengthen the metrology system as a key component of technical infrastructure; and to ensure that it is aligned with international best practice. The NMISA provides essential support to South African enterprises, as well as for public policy objectives with regard to measurement compliance issues in terms of health, safety and the environment.

The NMISA's purpose is reported on below in terms of the equipment and the processes to effect the NMS; the process to benchmark and establish confidence in the NMISA; the dissemination of the NMS and technology transfer to industry, such as the contribution to IPAP; the NMISA Recapitalisation Programme; as well as the representation of South Africa in the Metre Convention, its organs and the region.

2.2.1 Key Achievements

In order to be accurate and internationally accepted, the national measurement infrastructure and services of a country must be linked to the international measurement system. This link is provided by the NMISA, as mandated by the Measurement Act, to apply the International System of Units (SI) and other units approved for use in South Africa, as well as to maintain and disseminate the NMSs.

The activities of the NMISA support the dti's objectives, as well as IPAP, and contribute towards government's 12 national outcomes. The NMISA works closely with the other dti TI Institutes towards a comprehensive standards, quality assurance, accreditation and metrology (SQAM) environment. The organisation supports "locking out" unsafe and poor quality imports and "locking in" access to increasingly demanding export markets. The activities of NMISA further support analyses of food, the environment and healthcare, measurements aimed at law enforcement and the more effective use of natural resources.

The technical activities are fully supported by the Finance and Corporate Services Division and compliance and performance management is assured via the Compliance and Corporate Governance and Internal Audit sections.

The purpose, strategic objectives and performance highlights of the technical divisions are summarised in the relevant sections. The activities of the technical divisions jointly contribute to the main objectives, namely the maintenance, improvement, equivalence and dissemination of the NMS. The budget associated with the strategic objectives is therefore reported for the Institution as a whole and not per division.

2.2.1.1 Development and Maintenance of the NMS

New Gas-flow Measurement Standard

NMISA recently procured, validated and commissioned a new gas-flow calibration standard. The Flow Laboratory provides much needed measurement traceability in the fields of, inter alia, environmental air quality monitoring and stacks emissions testing. Since its commissioning, the laboratory has been inundated with gas-flow calibration requests and the external income is exceeding all expectations.

New Coordinate Measuring Machine

A new high-accuracy coordinate measuring machine was commissioned from the Length Laboratory to ensure support for the advanced manufacturing industry and, more specifically, the automotive industry, in support of IPAP initiatives. The system is in use for various calibrations and measurements of the standard parts and for the more than 300 industrial CMMs in industry. The ever-increasing smaller tolerances allowed during manufacturing require more accurate three-dimensional (3D) measurements.

The new high accuracy coordinate measuring machine is to be used not only for the measurement of high-accuracy parts, but also for the calibration of master parts.

New Measurement Capabilities for Light Emitting Diodes (LEDs)

Lighting consumes about 20% of all electricity. It is estimated that the replacement of conventional lamps with light-emitting diodes (LEDs) will lower this number to 4%, assuming full-scale adoption. A scientific approach is required to ensure that human needs for different types of lighting in different settings are accommodated within energy-saving initiatives. Since the LED is a unique source with photometric characteristics that differ from those of conventional lamps, dedicated equipment is required to provide traceability for LED parameters (average luminous intensity, luminous flux and colour coordinates), while new measurement methods are also required.

Eleven international standards pertaining to LEDs were adopted as South African National Standards or South African Technical Standards. A guideline and two standards were compiled by the LED Working Group. The guideline, inter alia, covers the modification of luminaires for tubular fluorescent lamps to retro-fit LED tubular lamps. Measurement traceability for LEDs is required by the user community and NMISA initiated a project to investigate and develop a calibration facility for the calibration and testing of LED modules. Basic measurement equipment was procured to measure the optical properties of discrete LEDs, lamps and small luminaires. This was done to address an urgent need for the traceability of lumen and other colour quantities by the South African lighting industry.

Research Activities in Support of the Green Economy and IPAP

Measurements are performed with the new detector attached to the scanning electron microscope (SEM), purchased for Capex with additional funding from the dti, in order to establish its performance and accuracy. The main advantage of the new detector is that light elements present in biological samples, as well as some solar cells and advanced materials used in the automotive industry and in aerospace, can be detected more accurately. NMISA is preparing a paper on this issue and is doing measurements, comparing the capability of the new system, using CRMs versus using the normal semi-quantitative route (from theory and software pre-loaded standards). The preliminary results indicate the possibility of errors when using the standard software and a substantial improvement in accuracy when using the metrological approach. The results of the study will assist the more than 30 SEMs in industry and academia to obtain more accurate results – even with older detectors.

2.2.1.2 Establish Confidence via International Benchmarking

As part of NMISA's mandate to keep, maintain and realise the measurement standards for South Africa, international participation in various forums and committees and their technical activities are necessary. The importance of such participation is to prove the international equivalence of South Africa's measurement standards and, in so doing, assisting in breaking down technical barriers to trade. Benchmarking of the South African NMSs is performed at two distinct levels. The higher level capabilities (highest accuracy measurements with smallest level of uncertainty) are benchmarked via the activities of the CIMP's consultative committees and measurements with an associated bigger uncertainty or that are specific to a region, via the technical working groups of the regional metrology organisations (RMOs) – in NMISA's case, AFRIMETS.

NMISA's measurement capability claims must then be approved by the AFRIMETS technical working groups before they can be submitted for international acceptance. It is therefore of paramount importance for NMISA to participate in AFRIMETS and its technical working groups. The annual AFRIMETS General Assembly and its associated working groups were attended by NMISA representatives in Lusaka, Zambia during July 2013. Metrologists from NMISA chaired the Length, Mass and Related Quantities and Quality System technical committees. The results of a number of regional inter-laboratory comparisons were discussed; four new regional studies were approved; and a workshop was held on the preparation of calibration and measurement capabilities.

Nanotechnology Support

To provide traceability for nanoparticle size analyses, using the SEM, NMISA participated in an international study organised by the Versailles Project on Advanced Materials and Standards (VAMAS), namely "Size characterisation of airborne SiO2 nanoparticles with on-line and off-line

measurement techniques: an inter-laboratory comparison study". The results were published in the Journal of Nanoparticle Research. NMISA's performance in the study confirmed that the capability of its laboratory compares well with the best in the world, even though NMISA's SEM that was used is one of the older instruments by comparison. NMISA plans to replace the SEM in 2014/15. NMISA is currently preparing to conduct a particle size proficiency testing scheme (PTS) for SEMs in industry (mostly mining, automotive manufacturing, chemicals and plastics, as well as advanced manufacturing).

Pesticide Proficiency Testing Scheme

The accurate measurement of water quality is critical in ensuring the safety of water prior to its intended use. Proficiency testing schemes (PTSs) are a recognised form of assessing the technical competence of laboratories performing the analyses.

Several local PTS providers are addressing the competent assessment of microbiological, physical and inorganic chemical testing of water, but a clear need for a South African PTS provider for an organic contaminant analysis of water was identified and coordinated by NMISA during 2012. A second PT comparison was conducted during 2013 and the sponsorship for participation by five African NMIs was provided by the National Metrology Institute of Germany (PTB). This allowed for an initial assessment of the national laboratories' capability to measure harmful pesticides in water at the challenging part-per-trillion level. The final results clearly indicate the need for more education in, and support for this type of analysis, which was one of the objectives of the comparison.

To raise awareness of this NMISA service, the participant results were discussed at the PTB-sponsored SADC Water PT Workshop in Kenya, with African delegates from international commercial laboratories and NMIs in attendance. Although the workshop dealt with the inorganic analysis of water, interest in participation in NMISA's organic pesticides in water PT was again confirmed.

Assistance with Solar Cells

The X-ray Photoelectron Spectroscope (XPS) is functional once more, after being out of commission for seven months; thus affording NMISA the opportunity to participate in a benchmarking study with the Korean NMI (KRISS) to compare the atomic fractions of copper, indium, gallium and selenium in thin CIGS alloy films – a semi-conductor material used in the manufacture of solar cells. By improving the measurement accuracy of these thin films, solar cell efficiency and cost can be optimised.

Measurement Assistance for Monitoring Programmes in the RSA

NMISA continues to assist industry with analysis requests and, more in particular, assisting with measurement challenges that cannot be addressed by commercial South African laboratories. Blood, plasma and urine are used as bio-monitoring tools for exposure to persistent organic pollutants (POPs). Exposure to POPs has been associated with a myriad of negative health effects, resulting in stringent regulations pertaining to these chemicals. NMISA staff Members assisted academia with two challenging analyses, namely the determination of DDT and its metabolites in dog plasma and the development of an extraction and clean-up method for polycyclic aromatic hydrocarbons (PAHs) in sediment.

PAHs are a group of organic chemicals formed by incomplete combustion. Previous studies identified PAHs in the South-African environment, with high levels found in the Soweto/Lenasia region. Consequently, it is crucial to determine the levels of PAHs in the Soweto/Lenasia catchment area and to develop a clearer picture of environmental and human exposure.

NMISA is therefore contributing to these monitoring programmes via the provision of reference measurement services in this field to several tertiary academic institutions, including the University of Pretoria and North West University. This collaboration will see the development of several new analytical measurement services for persistent organic pollutants during 2014/15.

2.2.1.3 IPAP and the Dissemination of Traceability to Industry

2.2.1.3.1 Green Industries

Global Atmospheric Watch

The Global Atmosphere Watch (GAW) is a worldwide system established by the World Meteorological Organization (WMO) (a United Nations agency) to monitor trends in the earth's atmosphere. It arose in the 1960s out of concern for the state of the atmosphere.

The GAW station, situated at Cape Point, plays a very important role in enabling South Africa to monitor the trends of traces of greenhouse gases, such as methane, carbon dioxide, ambient level ozone, etc., that have a direct impact on decision makers with regard to issues such as climate change.

NMISA was requested to assist the Cape Point GAW by providing measurement traceability in support of the ongoing measurements of gases, performed by the GAW station, that feed into the South African Air Quality Information System (SAAQIS), that provides a common platform for managing air quality information in South Africa. It makes data available to stakeholders, including the public, and provides a mechanism to ensure uniformity in the way that air quality data is managed – i.e. captured, stored, validated, analysed and reported on – in South Africa.

Since the Cape Point GAW/WMO site has an international obligation to report its monitoring of data measurements on different gases, NMISA is to draft a proposal on various aspects of projects, starting with bilateral comparisons with GAW/WMO laboratories, such as the National Oceanic and Atmospheric Administration (NOAA), to prove NMISA's measurement capabilities for gas analysis at the highest level of measurement traceability for trace gases at an ambient level and, ultimately, to provide the much needed traceability.

Compliance with the Air Quality Act

A Section 21 Notice was issued in November 2013, which is related to the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), the "AQA", and instructs that "all emission monitoring tests must be conducted by SANAS accredited laboratories", effective from 1 April 2015. In order to comply with this requirement, stack-testing facilities have been working towards accreditation with SANAS' Ambient Air Specialist Technical Committee (STC).

An agreement was finalised between the Regulator, the Department of Environmental Affairs (DEA) and the STC on the standard methods that would be acceptable for performing the stack tests. The National Laboratory Association (NLA) also assisted stack-testing facilities with the establishment of an association, the Stack Testers Association (STA), to discuss issues related to accreditation on a level playing field, in a highly competitive market, dominated by commercial laboratories.

It will be necessary for a stack-testing facility to draft a quality manual and to prepare test procedures in accordance with the requirements of ISO/IEC 17025. During the document review for the manual, SANAS will be able to assess whether additional requirements for the elements of ISO/IEC 17025 would need to be agreed upon and documented for the accreditation of the facility to proceed. The documentation of the additional requirements will then be the responsibility of the STC, which comprises technical experts in the field.

2.2.1.3.2 AGRO-processing

Contaminants and Residues in Foodstuffs

Maintaining vigilance with regard to safe imports of food commodities indicates that South Africa's rice imports have increased to around one million tons in the period May to April 2013 (according to the United States Department of Agriculture Post). This figure is up by approximately 8% from the previous year. South Africa mainly imports rice from India, Brazil and Vietnam. Several toxic elements need to be monitored in rice, because they can be assimilated from the soil in which the rice is grown and accumulate in the rice grains.

In view of the requirement to measure these toxic elements (arsenic, cadmium, mercury and lead) at trace and ultra-trace levels for the monitoring of imported rice, NMISA established international measurement equivalence capability for the analysis of these elements and participated in an international comparison pertaining to the determination of trace levels of cadmium in rice as proof of continued competence to provide this service to industry and inspection bodies, as well as for the confirmation of international measurement equivalence.

The laboratory is to extend this measurement capability to include the determination of arsenic species in food matrices, with the objective of establishing a capability for the analysis of arsenic species in fish, which is also expected to become regulated with regard to South African produce in the near future.

Dioxins and Emerging Pollutants

NMISA is in the process of developing a local capability for the measurement of dioxins and furans, two of the most toxic POPs. Validation of the dioxin method was initiated via a bilateral comparison with the Ontario Ministry of the Environment, Canada (MOE). Both the GC×GC-TOFMS

and the GC-HRMS results show a good agreement with regard to the 17 individual toxic dioxin and furan congeners. Challenges pertaining to the extraction technique and result reproducibility will be further resolved.

At the Dioxin 2013 Conference held in South Korea, NMISA presented its recent progress with the dioxin method development for monitoring these pollutants. The conference also highlighted the direction in which international environmental research is currently moving. The focus is no longer only on classical POPs, as initially defined by the Stockholm Convention, but it now also falls on emerging pollutants. Measurement is also moving from environmental matrices towards human tissue, including plasma and urine, as a more direct indicator of toxicity and exposure. Therefore, the importance of, and need for matrix-matched CRMs are ever increasing. Virtually no publication is currently accepted without a detailed description of the QA/QC methods used during analysis. In addition, as environmental analysis moves quickly into emerging pollutants, many of the authentic standards for the compounds of interest required are not commercially available. This could indicate a strategic opportunity for NMISA in the field of environmental research.

Mycotoxins in Maize

The presence of contaminants and residues in foodstuffs is an international concern, as reflected in the numerous regulations within South Africa's major export markets, namely the EU (EC 1881/2006 setting maximum levels for contaminants in foodstuffs), the US and Japan, together with South African legislation based on the World Health Organization (WHO) Codex Alimentarius general standard for contaminants and toxins in food. In addition, stricter food labelling regulations under the Foodstuffs, Cosmetics and Disinfectants Act, 1972 (Act No. 54 of 1972) (R146, March 2010), now require analyses of claimed nutritional content to be determined only by accredited laboratories.

In support of food exports and national food safety, NMISA is in the process of developing internationally accepted reference measurement capabilities for these contaminants. In support of mycotoxin measurement services (mycotoxins are very toxic substances released in foodstuffs by fungi and are regulated internationally and locally), NMISA successfully participated in two international comparisons, organised via the UK Food and Environment Research Agency (FERA) Food Analysis Performance Assessment Scheme (FAPAS), namely, mycotoxins in maize and tricothecenes in maize.

The results obtained in these comparisons will support successful attainment of ISO 17025 accreditation of the mycotoxin in maize value assignment method used in the certification of the mycotoxin reference material under production at NMISA.

Packaging

NMISA conducted a technical advisory forum (TAF) for the plastics and packaging industries. The purpose of this TAF was to determine what measurement support NMISA should be offering to the plastics and packaging testing laboratories in South Africa. The objective was to interact with, and gain insights from plastics and packaging industry stakeholders, in order to provide the dti with an indication of what the industry needs are in terms of analytical testing capabilities. The TAF was guided by the development of a new SANS 1548-1 PET standard for recycled material, intended to come into contact with food. The suggested route for meeting the measurement needs is via collaboration, where local testing laboratories partner with each other and international laboratories that are already active in these types of measurements.

2.2.1.3.3 Information and Communication Technology

Improved Accuracy for Fibre Optic Wavelength Measurements

Dense wavelength division multiplexing (DWDM) is a method used to increase the amount of data that can be sent across fibre optic networks. It has become standard technology in high-capacity telecommunications networks, of which the links range in length from a few kilometres to thousands of kilometres. DWDM improves the data-carrying capacity (bandwidth capability) of networks by sending more than one data stream through a single fibre. Every data stream is sent at a specific optical wavelength (i.e. frequency), called a "channel". In this way, each fibre in a network can carry many independent channels simultaneously.

Wavelength measurements become progressively more important as the number of channels increases.

This is due to a concomitant reduction in the wavelength gap (channel spacing), maintained between adjacent

channels. “Dense” in DWDM means that the channels are very closely spaced. Accurate wavelength measurements are required to differentiate between consecutive channels, so that their signals can be received independently. Currently, telecommunications applications utilise wavelengths around 850nm (multimode fibres), as well as in the whole range from 1 260nm to 1 675nm (single-mode fibres).

Owing to its importance for DWDM, the wavelength region in which the highest accuracies are required, is that between 1 460nm and 1 625nm (which includes the so-called S, C, and L bands). During the period under review, the NMISA fibre optics laboratory achieved a fourfold reduction in the accuracy of wavelength measurements (from 0,2nm to 0,05nm) beyond 1 543nm.

Extended Frequency Range for Radio Frequency Power, Attenuation and Impedance

NMISA realised the national measurement standards for RF power, attenuation and impedance, which serve the following industries: telecommunications, aerospace, defence, radar and electromagnetic issues related to health and safety. The laboratory provides traceability for test and measurement instruments, used by the ICT industry for the installation and maintenance of communication infrastructure, which includes cellphone installations, radio and television broadcasting, wireless local area networks and point-to-point communications.

Air traffic control, communication from and to the aircraft, collision avoidance radar systems and navigation systems, based on GPS, use equipment that requires proper calibration of RF parameters to work at optimum performance. RF metrology impacts on these projects, since no meaningful results can be expected if non-traceable measurements of electric field parameters or guided-wave parameters are used to interpret the results.

During the period under review, NMISA’s RF power measurement capability was extended from 50 GHz to 67 GHz in 1,85 mm coaxial transmission lines. In addition, the frequency range for attenuation and impedance was extended from 50 GHz to 67 GHz for devices with a characteristic impedance of 50 Ω.

The ability to operate at the higher frequencies was successfully demonstrated and measurement services to industry can now be expanded.

Improved Measurement Capabilities for Capacitance and Inductance

NMISA is utilising a newly purchased precision least-cost routing (LCR) meter and a group of eight standard capacitors to realise the national capacitance scale (by importing traceability from another NMI) and disseminate it to industry. Similarly, this LCR meter is utilised in conjunction with six standard inductors to realise and disseminate the national inductance scale. This equipment upgrade enabled the Institute to improve its measurement capabilities for capacitance and inductance, in order to serve the demand of the telecommunication and power utility industries.

Nuclear Energy

An X-ray system was delivered and installed. The system has a high stability constant potential digital 320/450 kV X-ray unit, associated filter wheel and a working bench. The system will be used to disseminate traceability to the health and nuclear industries. It is a replacement system that became obsolete as it was discontinued by the supplier and there was no support from the manufacturer. The Ionising Radiation Division is now in the process of commissioning the system. This facility will contribute towards ensuring safety for all ionising radiation workers, whether in the nuclear or health industry, in line with international standards and norms.

2.2.1.3.4 Health and Safety

Nuclear and Health

The NMISA Radioactivity Standards Laboratory obtained a set of dose calibrator reference/check sources. These sources are to be used to check the calibration of dose calibrators in hospital and isotope production facilities. It forms part of the development of a new procedure to accurately calibrate dose calibrators, using a set of radioactive standards.

These dose calibrators are used to measure the dose administered to patients during nuclear medicine studies. Nuclear and radiation techniques are commonly used in the diagnosis and treatment of a large number of health problems, such as infectious and non-communicable diseases (cardio-vascular disorders or cancer). Nuclear

medicine procedures use radioactive sources for the diagnosis and treatment of diseases.

Diagnostic radiology employs an array of imaging technologies, such as X-ray radiography, computed tomography (CT), nuclear medicine, positron emission tomography (PET) and magnetic resonance imaging (MRI) to diagnose or treat diseases. PET/CT is a combination of nuclear medicine and radiological tests that allows better detection and staging of diseases.

Radiotherapy is used to complement surgery or, at times, chemotherapy for cancer treatment. Radiation used for both diagnostic and therapeutic purposes must be delivered in the most effective and safest way possible. The radiation dose administered to patients during those medical procedures must be closely monitored by dosimetric tests, performed by medical physicists.

In support of this work, NMISA is establishing capabilities for diagnostic radiology and brachytherapy. Furthermore, a project for establishing an audit function in South Africa for radiotherapy centres was secured via donor funding towards cost-sharing for the procurement of equipment with training costs fully covered. NMISA's progress is in line with the establishment of the capability for diagnostic radiology.

The strategy for establishing capability for brachytherapy high-dose rate measurements had to be changed, due to high instability of measurements performed at a hospital facility and an increase in ^{60}Co (cobalt) high-dose rate units installed in hospitals, when previously only 192Ir high-dose rates were available. A recommendation was made that NMISA should invest in its own unit that will have ^{60}Co and ^{192}Ir (iridium) high-dose rate sources. This would ensure that all hospitals requiring this service are covered and the accommodation and environment conditions are controlled, and therefore decreasing the instability of measurements.

For medical diagnostics, NMISA's Mass Laboratory calibrated instruments that are used to calibrate ventilation measuring apparatus – the movement of air into and out of the lungs – which assists in the diagnosis of various lung infections.

Neutron Fields Abound

Man-made neutron fields are found in the controlled areas of nuclear fission reactors, (i.e. power plants and research reactors), as a result of fusion experiments, as well as from particle accelerators for medical and industrial applications, and basic research into nuclear, high-energy particle and condensed matter physics. Neutron fields are also found near transport containers and intermediate repositories of highly radioactive waste. Naturally occurring neutron fields are due to high-energy cosmic rays and are of practical relevance in high-flying (> 10 km) air or spacecraft. Due to their high penetrability as uncharged particles, neutrons often account for a substantial fraction of the total dose behind radiation shielding.

The reliable measurement of neutron radiation requires well adapted and calibrated instruments, which calibrations must be performed in a neutron field with procedures following the recommendations of international standards. NMIs should be able to provide references for these kinds of neutron fields with relevant energy distribution and intensity.

NMISA calibrates neutron monitors, using three sources of different activities [50 Curie (Ci), 5 Ci and 0,5 Ci]. For high energy ranges (≥20 MeV), the German NMI, PTB, has been using the beam line at the iThemba LABS to perform calibrations. A meeting was held between iThemba LABS, PTB, UCT, IRSN and NMISA to discuss how this service could be managed in South Africa by a local laboratory under the umbrella of the NMI.

There are currently only seven countries with capabilities to offer this service internationally and the iThemba LABS has a preferred beam because it is very clean – i.e. without satellite peaks usually found in other facilities. A letter of intent for nominating the iThemba LABS for this capability was issued by NMISA and an MoU is being finalised.

2.2.1.3.5 Road Safety (breath alcohol analysis, speed-trapping, etc.)

Safe Vehicles

The NMISA Length Laboratory participates in the National Standard for Traffic Law Enforcement for the Use of Speed Traps (SANS TC 78) Committee.

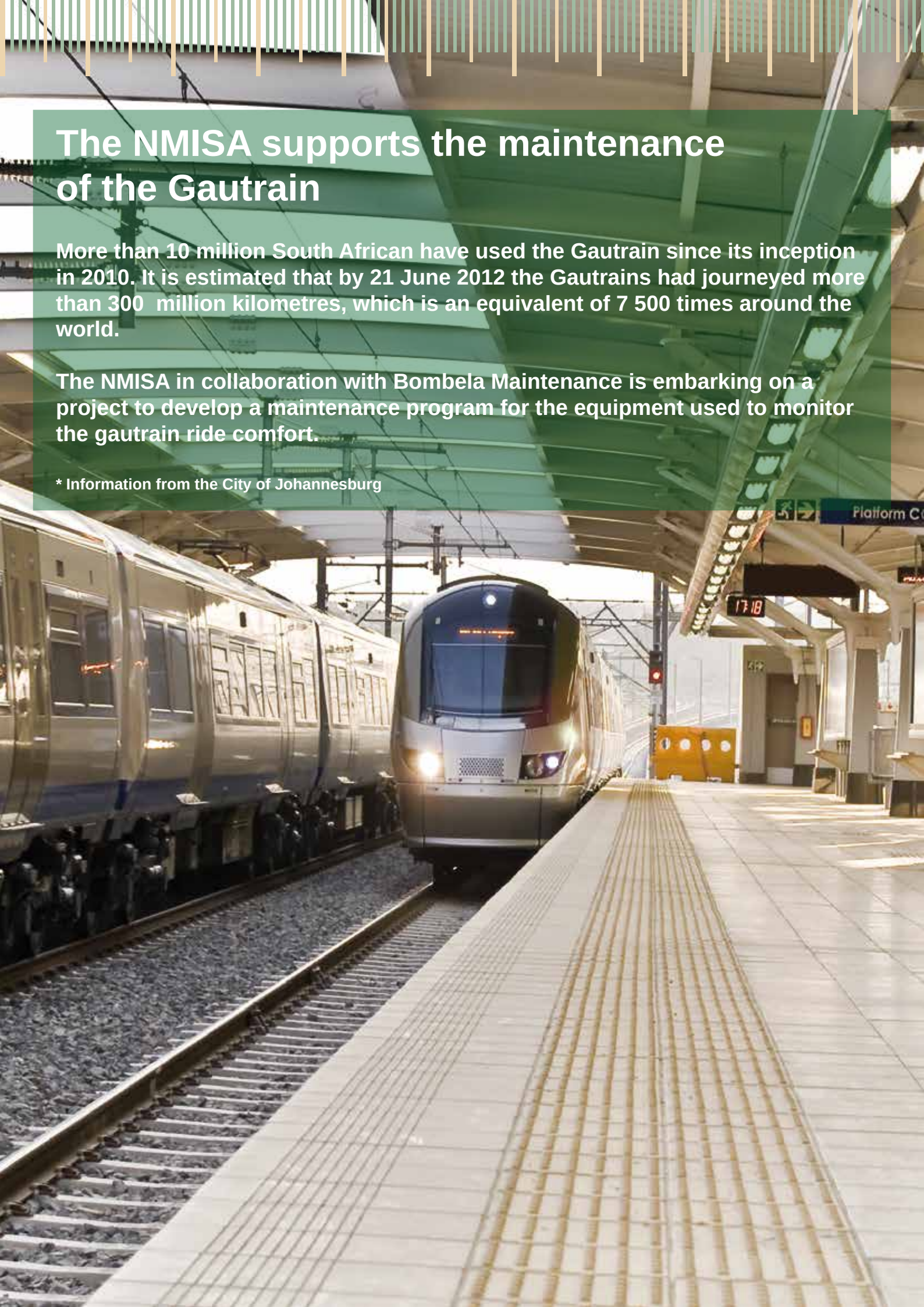
The Length Laboratory also provides traceability to law enforcement agencies regarding vehicle speed measuring equipment. Traceability was provided to Inertia Measuring

The NMISA supports the maintenance of the Gautrain

More than 10 million South African have used the Gautrain since its inception in 2010. It is estimated that by 21 June 2012 the Gautrains had journeyed more than 300 million kilometres, which is an equivalent of 7 500 times around the world.

The NMISA in collaboration with Bombela Maintenance is embarking on a project to develop a maintenance program for the equipment used to monitor the gautrain ride comfort.

*** Information from the City of Johannesburg**



Units (IMUs), thus ensuring the safe operation of motor vehicles.

Gautrain

The NMISA Vibration Laboratory embarked on a collaboration project with Bombela Maintenance, the company contracted to maintain the Gautrain, in order to develop a maintenance programme for the equipment used to monitor Gautrain ride comfort.

Improved Range of CRMs for Blood Alcohol Analysis

To address the proposed new regulations for reducing the legal limit for driving under the influence of alcohol, an improvement on the current range of aqueous ethanol CRMs produced and provided to the DoH laboratories, resulted in the development of the new 0,005 g/100 g aqueous ethanol standard to assist the NMISA clients with meeting these ever more stringent levels. The NMISA's lowest aqueous ethanol CRM in the current range is 0,01 g/ 100 g, and therefore analysts would be working at the lower end of the calibration curve for quantitation with fairly large uncertainties, and the new lower CRM will mitigate the risk that laboratories could face in the determination of accurate blood alcohol concentration.

2.2.1.3.6 Research Outputs

Publications

Research and experimental development are essential for NMISA to stay relevant and competitive in the long run, and are required to address national measurement needs in support of advanced technologies. NMISA also assists national enterprises with state-of-the-art measurement technology to improve competitiveness and support national priority programmes – for example the development of small, micro and medium enterprises (SMMEs).

During the period under review, NMISA published 20 peer-reviewed scientific papers in relevant journals. The importance and impact of publishing NMISA scientific outputs cannot be emphasised enough, as publishing is the medium via which the Institute is able to demonstrate development work in metrology.

An excerpt of some of the papers published in prestigious journals is included below.

Table 4. Prestigious Journal Excerpt of Publications for 2013/14

Publication: Title and short description	Journal
'EBSD analysis of W-filament carburization during the HWCVD of MWCNT', Oliphant et al. The study highlighted original characterisation done in materials metrology of metals and ceramics, using electron back scatter diffraction, and was further validated by other advanced techniques at UFS, the CSIR (MMP) and the CSIR's Nano Centre.	Microscopy and Microanalysis
Characterization of silicon nitride thin films deposited by hot-wire CVD at low gas flow rates', Oliphant et al. The study focused on the synthesis and the characterisation of silicon nitride thin films, which are used as antireflective coatings on solar cells. The research was conducted in collaboration with UWC.	Applied Surface Science
'Dioxin Analysis Access', De Vos et al. The article describes the significant challenges in dealing with safe toxic waste disposal and its subsequent monitoring in the developing world, where access to qualified staff and adequate facilities is often lacking and creative solutions are required. The research was conducted in collaboration with UP.	The Analytical Scientist
'Applying Comprehensive Analysis to EPA Method 1613B Samples — Discover Those Compounds Usually Discounted in Environmental Samples', De Vos et al. The article describes the first high-resolution analytical capability for dioxin quantification in South Africa; it forms part of validating the dioxin capability. The research was conducted in collaboration with UP.	Current Trends in Mass Spectrometry

Table 4. Prestigious Journal Excerpt of Publications for 2013/14 (continued)

Publication: Title and short description	Journal
Converging halogenated pollutant profiles and risk in aquatic and terrestrial bird eggs,' Quinn et al. The article covers the increased levels of chlorinated contaminants monitored in bird eggs; directly linking pollution levels to the ecosystem. The research was conducted in collaboration with NWU.	Environmental Research
'Standardization of Tc-99 by three liquid scintillation counting methods', van Wyngaardt, van Staden, Lubbe & Simpson. This was the first participation by NMISA in a low level comparison: CCRI(II)-S9 exercise, with published results.	Applied Radiation and Isotopes
'Thermal analysis and FTIR studies of volatile corrosion inhibitor model systems, Nhlapo et al. The article covers the use of thermal analysis methods (DSC) and the use of the evolved gas analysis methods (TGA-FTIR) in the characterisation of model compounds simulating the amine-carboxylic acid-based volatile corrosion inhibitors. The research was conducted in collaboration with UP.	Corrosion Science
'Thermoxidative degradation of LDPE nano-composites: Effect of surface treatments of fumed silica and boehmite alumina', Nhlapo et al. The articles covers the preparation and thermal characterisation of nanocomposites, based on fumed silica (FS) and the synthetic boehmite (BA) in 5 wt.% in low density polyethylene (LDPE) polymer. The research was conducted in collaboration with UP.	Polymer Degradation and Stability

2.2.1.4 Recapitalisation Project

NMISA's second largest risk is the ageing of equipment. This includes national measurement standards, laboratory standards and other critical equipment. Almost 30% of the national measurement standards, laboratory standards and equipment are 10 to 20 years old or even older and are no longer supported by the manufacturers. The most important instrumentation procured, ordered or being evaluated, are listed below:

- A fluke oil-lubricated pressure balance and a 100 MPa gas booster for the Pressure Laboratory.
- Equipment to facilitate the upgrading of laser distance interferometers, for which three laser heads were bought to replace broken systems, as well as a new laser displacement system and a high-accuracy CMM for the Length Section.
- A replacement for the secondary vibration calibration system in the medium frequency range for the Vibration Laboratory.
- Two sets of primary mass standards for the Mass Laboratory.
- For microanalysis (nanoparticles, metal alloy and advanced materials), a new silicon drift energy dispersive spectroscopy (EDS) detector for the high-resolution scanning electron microscope (SEM).
- In support of especially metal beneficiation and the glass manufacturing industry, an upgrade of the analysis package for the scanning X-ray photoelectron spectroscope.
- Nitrogen generators in support of reference analysis and CRMs.
- A portable spectroradiometer for physical metrology.
- A beta system to be used for the calibration of personal and area dosimeters and a dose rate meter.
- A Karl Fischer coulometric titrator for moisture determination (purity) of chemical compounds.
- An LED spectrometer in support of measurement standards for energy efficiency.
- A surface texture measurement machine in support of the automotive industry.
- A multi-function calibrator for electricity and magnetism.
- A particle size analyser for nanoscience measurements.
- A particle emission rate system for ionising radiation.
- A gel permeation chromatography system for reference analysis and CRM production in chemistry.

2.2.1.5 Representation at National and International Forums and Publication Outputs

2.2.1.5.1 SME Support

NMISA participated in a number of SME expo and trade shows, organised by the NSBC, which were held in the various provinces around the country. The NSBC SME Expo and Trade Shows offer a widespread array of powerful and unique solution-driven exhibits and seminars that deliver practical and interactive information, strategies and ideas, which could be applied to building a small to medium size business. For example, the Port Elizabeth Show

was attended by more than 1 000 delegates and NMISA distributed information leaflets on its activities to a number of SMEs. Contact was also made and discussions were held with 17 SMEs from the manufacturing sector, on the SME toolkit and the way in which NMISA could assist with their measurements needs. During the discussions and using the toolkit questionnaire, it was established that most of the SMEs that manufacture various products, like pine gel, foam bath, dishwashing liquid, floor polish, fabric softener, engine cleaner, soap, hair products, etc., do not calibrate their instruments – i.e. they don't measure accurately.

NMISA also participated in the SME Expo and Trade Show in Durban, KZN. The show was attended by more than 2 000 delegates and NMISA had an exhibition stand and distributed information leaflets on its activities to a number of SMEs. Contact was made and discussions were held with 16 SMEs from the manufacturing sector, on the SME toolkit and the way in which NMISA could assist with their measurements needs.

NMISA exhibited at the National Small Business Chamber (NSBC) SME Exhibition and Trade Show in Cape Town, where the NMISA measurement toolkit was introduced to SMEs and 26 SMEs were trained in using the toolkit to identify their measurement needs. A training video is in the process of being developed to address the issues identified during this and previous expos.

SMEs do not understand that the importance and the intervention of the measurement toolkit could be of much help to them. It can therefore be concluded that there is need for training in measurement practices, as well as to ensure that measuring instruments are calibrated and traceable to the NMSs.

2.2.1.5.2 Assistance to Government Departments

Ethanol and NaF PTS

During the period under review, NMISA continued to provide certified reference materials (aqueous ethanol, sodium fluoride and primary reference gas mixtures) and accurate measurements, which provide South African citizens with the confidence that the measurements provided by testing laboratories and quality assurance laboratories are accurate. The dissemination of traceability for critical forensic blood alcohol measurements, used in law enforcement, was maintained. These included the aqueous ethanol and sodium fluoride solutions.

Traceability of measurement results, in conjunction with proficiency testing, is a key requirement for accreditation to ISO 17025. NMISA strives to provide the necessary chemical traceability to these analytical laboratories, while continuously benchmarking its own capabilities to disseminate traceability via CRMs and the provision of PT schemes. NMISA-PT-ORG11 Round 3 of the tri-annual ethanol proficiency testing scheme was completed. The next round will take place during 2014/15.

Concerns were raised by the Department of Health (DoH) forensic laboratories (FCLs) on the procurement of NMISA ethanol CRMs. As a government entity, the DoH FCLs are faced with similar procurement challenges and are required to test the market. NMISA is not the sole supplier of ethanol CRMs. NMISA is competing, not only with other NMIs internationally, but also with commercial ISO 34 accredited suppliers. The DoH has decided to continue using NMISA CRMs as it resulted in an increase in the number of ethanol CRMs orders received.

Assistance to the Region

The NMISA Technical Infrastructure Division participated in a Developing Economies Committee (DEC) Workshop at the Asia Pacific Metrology Programme (APMP) General Assembly in Taiwan. The DEC is responsible for helping to address the needs of NMIs from developing economies, as well as to oversee and coordinate associated work programmes. It is a forum that connects with similar organisations in other regions (such as AFRIMETS) or organisations aimed at collective efforts to plan and coordinate activities that could cater for the needs of NMIs in developing countries. A number of programmes were developed via the DEC, which NMISA has adopted and implemented in SADC countries. Mr D Masuku attended the General Assembly and related meetings in Taiwan, where he presented the Country Report. NMISA continues to participate in the APMP technical activities and programmes, as 20% of its CMCs are still being submitted via the APMP, as AFRIMETS is not yet capable of providing assistance in all the technical areas.

SADC Interaction and Assistance

NMISA participated in the recent Annual SADC SQAM meetings held in Gaborone, Botswana. The 29th SADC SQAM meetings were hosted by the SADC Secretariat, to reflect on and review the activities of the SADC SQAM Programme. The meetings also discussed and consolidated plans for the coming year, in the light of the new developments and requirements in the respective areas of technical regulations, standards, metrology and accreditation. The key discussions centred on the amendments to the Technical Barriers to Trade Annex to the SADC Protocol on Trade, of which the main objective is regional economic integration and the elimination of technical barriers to trade. As part of this Annex and the Industrial Development Policy Framework, SADC identified three priority areas, namely agro-processing, pharmaceuticals and mineral beneficiation,

which the SQAM Programme should focus on, as well as on designing work programmes that could support the implementation of the Annex and the Industrial Development Policy Framework. NMISA, via SADCMET, will consider what metrology programmes would be required for the work programme to be implemented.

Visits to NMISA

TID hosted a delegation from the National Metrology Institute of Ethiopia (NMIE), headed by the CEO of NMIE. NMISA explained its activities and operations for the effective and efficient running of a metrology Institute. An MoU to facilitate scientific cooperation and skills exchange between the two Institutes was signed. NMIE requested NMISA to assist with a cyclic (five-year) strategic review of the metrology activities in Ethiopia, starting in 2014/15.

2.2.1.5.3 Collaboration at International Level

The International Committee for Weights and Measures (CIPM) defines the international system of units (SI) and provides governance for the International Bureau of Weights and Measures, the BIPM. In May 2013, Dr Wynand Louw from NMISA was elected to this prestigious committee and became the first member of the committee born and schooled in Africa (since its inception in 1875).

CCAUV and CCL

The Consultative Committee for Acoustics, Ultrasound and Vibration (CCAUV) meetings were held at the BIPM in Paris, France during October 2013, which the acoustics expert and the vibration expert at NMISA attended. In conjunction with the CCAUV meeting, the Regional Metrology Organisations Working Group (RMOWG), the Key Comparisons Working Group (KCWG) and the Strategic Policy Working Group (SPWG) also met. The vibration expert from NMISA (Mr Ian Veldman) was re-elected by the President of CCAUV to serve another term as Chair of the CCAUV RMOWG. The AFRIMETS Technical Committee (TC-AUV) meeting was also held after hours in Paris during this period. The acoustics expert (Riaan Nel) was elected as the new Chair for the AFRIMETS TC-AUV.

A representative of the Length Laboratory attended the Consultative Committee for Length (CCL) and its associated working group meetings. Oelof Kruger is the working group Chair for Angle Standards. This working group is responsible for organising comparisons and facilitating discussions relating to current and future angle standards.

The laboratory was also selected as a member of the New Strategy Working Group, tasked to develop a new strategy document for the CCL.

CCQM Meetings held in Pretoria

The Consultative Committee for Amount of Substance: Metrology in Chemistry (CCQM) comprises nine working groups that meet every year at the BIPM in Paris. As part of the CIPM MRA, the CCQM Working Group meetings take place twice a year. The first meeting is held every April at the BIPM in Paris and the fall meetings are hosted by an NMI other than the BIPM, so as to provide networking and collaboration opportunities. Experts from the various NMIs attend the working group meetings to represent their Institutes and to provide feedback on international benchmarking activities; to discuss various work programmes, calibration and measurement capability claims, comparison results and resultant international equivalence; to plan new comparisons; and to contribute to the five-year strategy going forward.

NMISA, South Africa, hosted the 2013 CCQM Working Group meetings, including the 19th CCQM plenary meeting, in Pretoria at the Sheraton Hotel, from 4 to 7 November 2013. Hosting the CCQM meetings in Pretoria afforded chemistry staff the rare opportunity to attend all the meetings and to meet with international experts; obtain and share information and knowledge on how traceability is achieved for physical and chemical measurement; and to gain insight into the activities of local and regional role-players in chemical measurement. It is deemed essential training and was also an opportunity for staff Members to interact with industry, the dti and various stakeholders. There were 92 international delegates and 40 local delegates attending.

Collaboration with Brazil on the Analysis of Copper (Cu) in Wine

A recent international benchmarking of the capability to analyse Cu in red wine, showed discrepancies between the uncertainty estimation of the results obtained by Brazil and the other participants (including NMISA). The Brazilian NMI (INMETRO) then approached NMISA to assist with identifying and rectifying the issue.

The NMISA expert on this type of analysis was invited and sponsored by the Brazilian Government to spend two weeks at INMETRO in Rio de Janeiro to further develop the measurement method at INMETRO. The problem was identified and solved. It was also recommended that, in future, INMETRO should attempt to further optimise critical steps, such as moisture determination and instrument precision.

In addition, INMETRO staff Members were trained in the application of the procedure for two other types of analyses and matrices, namely Cd in rice and Cu and Pb in cachaça.

ISO/REMCO

The 36th meeting of ISO/REMCO (the ISO Committee on Reference Materials) was held in June 2013. At this meeting, the work on the development of ISO Guide 80 for the "in-house preparation of reference materials for quality control (QCMs)" was concluded. This guide outlines the essential characteristics of reference materials for quality control purposes, and describes the processes by which they can be prepared by competent staff within the facility in which they will be used. The primary target audience for this guide is laboratory staff, who are required to prepare and use materials for specific in-house quality control applications. Dr Angelique Botha is NMISA's representative on this ISO committee and was actively involved in reviewing ISO Guide 80.

Collaboration with the IAEA and WHO

NMISA had the opportunity to assist the IAEA in drafting and finalising a guidance document on radiation protection calibrations at secondary standards dosimetry laboratories. This document will assist laboratories that perform calibrations in the area of dosimetry with ionising radiation on instruments used for radiation protection purposes, with procedures on how to perform these measurements, especially taking into consideration the changes in technology and how these affect some of the instruments already being used by the end-users. This guidance document will be used to further develop training material for a dosimetry training course aimed at people working in accredited laboratories in South Africa.

NMISA was invited to represent South Africa at an international technical meeting, organised by the IAEA and WHO, on "Harmonizing Quality Audits in Radiotherapy and Promoting the Concept of Audit in Member States". NMISA had organised an audit for physics in radiation therapy centres on behalf of the South African Medical Physics Society (SAMPS) between 2005 and 2006. NMISA was requested to share their experiences during these audits and to discuss possible solutions to the challenges faced by countries in establishing, implementing and expanding a Dosimetry Audit Programme. The NMISA will be launching an audit programme for radiotherapy centres during 2014.

Collaboration between NMISA and NIS (Egypt) on the Development of an Optical Frequency Standard

NMISA and NIS (Egypt) are sharing knowledge on the development of an optical frequency standard via a collaboration project funded by the NRF. In February 2014, Dr Johan Burger visited NIS to further joint expertise. Experiments on two-photon absorption were performed, using a measurement facility built during previous visits and further improved by NIS. AM and FM two-photon spectra were measured and clear derivative signals were obtained. NMISA shared its expertise in accurately locking the laser to the rubidium cells, while the Institute gained knowledge on achieving a very low signal-to-noise ratio.

Collaboration with the European Metrology Research Programme

The Length Laboratory was chosen to form part of the stakeholder committee for the European Metrology Research Programme (EMRP), SIB 58 Angle Metrology.

Collaboration with Stellenbosch University and NIS (Egypt)

The Division initiated a collaborative project with both Stellenbosch University and NIS in Egypt to develop a double interferometer. The project proposal was approved by the NRF.

2.2.1.6 Organisational Support Achievements

2.2.1.6.1 HR Systems and Processes

- A new HR system (HR Premier) was implemented during the period under review. Effective people management depends on HR systems and processes that are able to generate informative data on job profiles, remuneration, vacancies, skills needs, employment equity, etc. The easy access to information gained via the system will enhance workforce planning and the recruitment of staff.
- An Employee Self-Service (ESS) System was also implemented to help replace the manual leave system, while other functionalities will be implemented during the next financial year.

2.2.1.6.2 Employee Recognition

A new Policy on Employee Recognition was implemented as part of the Retention Strategy. Some of the incentives offered included recognition of long service and enhancement of the annual achiever awards function, where the organisation formally gives recognition to its achievers.

2.2.1.6.3 Information Technology Management

- **Mail Archiving Solution:** This solution was deployed to ensure compliance and data retention to its Mail Solution.
- **Rack Implementation:** In terms of compliance, a solution was also necessary for ensuring compliance to business continuity. This solution provided IT with assurance with regard to critical systems that

are monitored by temperature, humidity and fire. In addition, it also enhanced the security of those systems by leveraging biometric access control.

- **Managed Print Solution:** This solution was deployed during Quarter 1 and provided IT with a cost-effective print solution that can be effectively managed.
- **IT Steering Committee:** This was also an achievement in the sense that IT needed to provide assurance to management and the Board for overall IT Operations and Management.

2.2.1.6.4 Finance and SCM

The following were achieved during the period under review:

- Successfully implemented the new chart of accounts for ease of reporting.
- Implemented the new and improved Accpac System, as well as an E-workflow System.
- The improvement of Supply Chain Management processes constituted a major focal area during the period under review, which drastically reduced irregular expenditure.

2.2.2 Key Challenges and Proposed Solutions

Table 5. Key Challenges and Proposed Solutions

Key Challenge	Proposed Action
Re-capitalisation (HVAC, ageing equipment, failing infrastructure)	Appoint transaction advisor, do a feasibility study, procure instrumentation to replace obsolete NMS
IT	Virtualisation
Supply Chain Management	Appoint senior procurement manager and expand SCM temporarily for recapitalisation
Scarce skills (engineers, chemists, physicists)	Improved advertising, head-hunting
Retention of staff	Salary benchmarking, safe working environment, staff recognition

2.3 PERFORMANCE AGAINST THE ANNUAL PERFORMANCE PLAN

NMISA adopted the balanced score card approach to set and measure performance targets. The NMISA Score card comprises three key components, namely stakeholder and customer perspective, learning and growth (organisational development) and financial perspective.

An updated balanced score card is presented below. Quarterly targets were defined for 2013/14, and targets were maintained as per the signed-off Annual Performance Plan and Business Plan.

The deliverables of the technical divisions are indicated below the organisational score card.

2.3.1 Stakeholder and Customer Perspectives

With regard to its stakeholders and customer perspectives, NMISA's core function is reflected in its scientific and technical outputs.

Strategic Outcome Oriented Goal	Strategic Objective #	Key Performance Outputs	Key Performance Indicator/ Measure	BUDGET (R'000)	Baseline 2012/13	Target 2013/14	Actual Achieved	Reason for Variance
Internationally benchmarked and accepted measurement standards	1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards maintained	57 862	50	50	52	Exceeded. Two additional NMSs were completed, as gazetted
		New certified reference materials and methods of calibration and/or improved NMS	New CRMs, measurements, methods of calibration, as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMS as listed in laboratory quality documentation		5	10	15	Exceeded. Programme to develop gas CRMs and analysis methods for organic compounds are ahead of schedule
	2	Demonstrated measurement capabilities	Number of calibration and measurement capabilities accepted on the International Key Comparison Database (KCDB)		366	382	386	CMCs for photometry were re-instated in March 2014 and some CMCs anticipated in 2014 were already accepted in 2013
Traceability, measurement expertise and services disseminated to South African commerce and industry	3	Dissemination of the NMS and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	23 315	R11 690 000	R10 600 000	R10 083 202	Revenue behind by R516 798. This was a stretched target that could not be reached. Industry 2009/10 dip has not fully recovered and calibration numbers are at lower levels than pre-2011
		Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold		86	200	210	Exceeded. More chemistry CRMs were sold
	4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement		14	49	84	Exceeded. Technical divisions focused on training during equipment breakdowns and more training opportunities at trade shows (SMEs)
			Number of courses developed and offered to industry		5	6	18	Exceeded. More requests for courses in industry

2.3.2 Internal Organisation (Learning and Growth) Perspectives

The Human Resources Department developed measures to increase core skills and staff capability, reduce employee turnover and ensure a fair and equitable workforce. Included are targets to develop and increase the pipeline of technical staff, as well as to increase the qualification profile, so as to foster more research & development (R&D) that is on par with developed metrology Institutes.

Strategic Outcome Oriented Goal	Strategic Objective #	Key Performance Outputs	Key Performance Indicator/ Measure	Budget (R'000)	Baseline 2012/13	Target 2013/14	Actual Achieved	Reason for Variance
Requisite expertise and competencies established and maintained in accordance with internationally acceptable standards	5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	22 898	21	18	20	Greater focus on research and output of research results, as well as increased collaboration with HEIs. Resulted in more publications: WITS, UP, UWC, UCT, NMMU, UJ, Limpopo, UFS , UKZN, US and NWU
			Number of oral and/or presentations given at conferences and workshops on the improvement and development of measurements and measurement standards		50	51	71	Focus on dissemination of metrology at national level resulted in more local conferences and workshops being attended, especially SME workshop opportunities and Technical Advisory Forums for Industry
	6	A skilled, competent and transformed workforce	Number of staff Members with PhDs	12 900	10	12	10	Two PhD staff Members resigned. One MSc staff member was appointed to fill one of the PhD positions. The other position remains vacant
			Number of staff Members with an M-degree		30	34	32	Target not achieved. Two technical positions could not be filled and remained vacant
			Number of postgraduate bursars		5	5	5	Although the target was achieved, it should be noted that one bursar discontinued his PhD studies and terminated his contract with NMISA at the end of Quarter 3. A project is expected to be finalised during the Quarter 1 of the new financial year and the bursary will be advertised
			Number of undergraduate bursars		6	3	3	Target achieved
			Number of interns and in-service trainees hosted		5	5	6	Target exceeded

2.3.3 Financial and Business Perspectives

These perspectives include measures that ensure effective financial controls, financial growth and stability, while improving the quality of internal processes and aligning and integrating systems and processes.

Strategic Outcome Oriented Goal	Strategic Objective #	Key Performance Outputs	Key Performance Indicator/ Measure	Budget (R'000)	Baseline 2012/13	Target 2013/14	Actual Achieved	Reason for Variance
Upholding the principles of good corporate governance and compliance with regulatory frameworks	7	Established systems and processes to ensure compliance with regulatory frameworks	Actual expenditure to revenue received	26 782	New KPI	100%	62%	R50 million received during the 2013/14 financial year not spent at year-end, due to delays in the Recapitalisation Project
			Unqualified audit opinion		New KPI	Unqualified audit opinion	Unqualified audit opinion	Target achieved
			% of total budget spent on CAPEX		10%	20%	17%	Procurement delays as a result of the cancellation of some tenders, which affected spending
		Reasonable assurance on the adequacy, effectiveness, efficiency of internal controls, risk management and governance matters	100% completion of approved Annual Audit Plan and issuance of audit reports	1 092	30	100%	100%	Target achieved
			Quarterly reporting to the Audit and Risk Committee		7	100%	100%	Target achieved
			Conduct 100% follow-up audit on Management Audit		1%	100%	100%	Target achieved
					>90%	>90%	90%	Target achieved
		Client Services/ Customer satisfaction	Customer satisfaction for external jobs (measurements, calibrations, CRMs, etc.).		>90%	>90%	90%	Target achieved

Technical Divisions Score Cards

a. Chemistry: Deliverables Achieved against Divisional Balance Score Card Targets

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards maintained	2	3	3	Section 13: Amount of Substance: 1. Reference materials (13a); maintained as per Chemistry Register 2. Reference Measurements (13b); as per Chemistry Register (This includes 16 reference measurement reports, of which 4 are included as new NMSs and one as in improved NMS) 3. Calibration Services (13c); calibrated 10 ethanol breathalysers and 11 ozone analysers		No variance – maintained as per section 13 in the Government Gazette. This references the Chemistry Reference Materials and Reference Measurements Register
	New certified reference materials and methods of calibration and/or improved NMS	New CRMs, measurements, methods of calibration as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMSs as listed in laboratory quality documentation	2	2	4	1. Pesticides in water 2. Melamine in milk 3. Ochratoxin-A in wine 4. Multiple mycotoxins in maize 5. Expanded range of Ethanol CRM (5 mg/100g)		Target exceeded. Method development for new and improved NMSs is always ongoing and is now ahead of schedule
2	Demonstrated measurement capabilities	Number of calibration and measurement capabilities accepted in the International Key Comparison Database (KCDB)	34	34	36	34 CMCs currently accepted maintained in KCDB. Added two new ones. 1. Copper in red wine 2. Lead in red wine		Target exceeded. Two CMCs, originally planned for 2014/15, already accepted at the end of 2013/14
3	Dissemination of the NMS and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	New KPI	R2 848k	R2 348k	Generated via CRMs and PRGMs sold, calibration of breathalysers and ozone analysers and reference measurements provided to industry	82%	Revenue behind by R499k. Attributed to late receiving of additional gas cylinders for PRGMs, and maintenance delays regarding the gas filling stations. This is not deemed a loss because NMISA has increased revenue, owing to reference measurement services to industry. The breathalyser calibration income has not recovered and this was included in the stretched revenue target. The division did bring in a large portion of the technical revenue.

a. Chemistry: Deliverables Achieved against Divisional Balance Score Card Targets (CONTINUED)

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	86	200	210	1. 94 x Gas PRGMs 2. 82 x Ethanol CRMs 3. 33 x Sodium Fluoride CRMs 4. 1 x Organochlorine pesticides in toluene	-	Target for CRMs sold exceeded. Would have been more had there not been delays in receiving the additional gas cylinders, the breakdown of the gas filling stations and the fact that the breathalyser calibrations had not recovered since the NPA court finding
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	2	2	4	1. Cornelius Rimayi, DWA-RQS 2. Luvonga Caleb, KEBS 3. Ms Adri Coetzee, NMU 4. Dr Marcelo D. Almeida, Dr Rodrigo C. Sena, Dr M. Cristina Quaresma INMETRO (same training)	-	Target exceeded. Opportunity for training metrologists at INMETRO (Brazilian NMI) not planned, but requested and paid for by INMETRO
		Number of courses developed and offered to industry	5	5	5	1. 2 x NLA Chemistry Uncertainty in Chemical Measurement 2. 1 x UP BSc Chemistry Hons Uncertainty Course 3. 1 x ICCA Sample Extraction Course 4. 1 x Introduction to POPs	-	Target met
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	6	6	7	1. Current Trends in Mass Spectrometry 2. Environmental Research 3. Measurement 4. Polymer Degradation and Stability 5. Corrosion Science 6. Metrologia (AFRIMETS.QM-K27) 7. The Analytical Scientist	-	Target exceeded
		Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	12	13	22	1. 1 x SepSci E-webinar 2. 1 x ISCC oral 3. 8 x ICCA orals and 1 x poster 4. 3 x Forensic Conference orals 5. 1 x ChromSA oral 6. 1 x WaterNet poster 7. 3 x Dioxin 2013 posters and 1x oral 8. 1 x KOFAS poster 9. 1 x Gas 2013 poster 10. 1 x ASMS poster	-	Opportunity provided to students to present at local conferences made it possible to exceed planned target

b. Physical Metrology: Deliverables Achieved against Divisional Balance Score Card Targets

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards Maintained	15	15	15	The division maintain all 15 of its gazetted National Measurement Standards in accordance with the IT to Quality Management System The calibration capabilities in the mass laboratory were improved to OIML accuracy class E1 New equipment was procured and/or old equipment was upgraded to ensure effective maintenance	-	Target met
	New certified reference materials and methods of calibration and/or improved NMSs	New CRMs, measurements, methods of calibration as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMSs as listed in laboratory quality documentation	-	-	-	-	-	No target set
2	Demonstrated measurement capabilities	Number of calibration and measurement capabilities accepted on the International Key Comparison Database (KCDB)	94	105	98	The division prepared and submitted CMCs for review to publish on the KCDB	93%	The review process for all the CMC submissions has not been completed
3	Dissemination of the NMS and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	-	R1 950k	R2 472k	The division, in a difficult economic climate, managed to make budget	-	Target exceeded
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	-	-	-	-	-	No target set

b. Physical Metrology: Deliverables Achieved against Divisional Balance Score Card Targets (CONTINUED)

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	-	8	13	The division trained metrologists from SWASA and MCIT – Weights & Measures in Swaziland – in mass and volume metrology. The mass laboratory trained 3 metrologists from NSi (Namibia) at NMISA.	-	Target exceeded. NMISA secured an UNIDO contract. The contract relates to project (100206). It is the first part of a larger project and entails a GAP analysis of the metrology needs of Swaziland and a proposal to address the identified needs. Training was provided in the fields of mass and volume metrology. In total. 10 metrologists received training
		Number of courses developed and offered to industry	-	-	3	Metrologists of the division were contracted by the NLA to present metrology courses – for example the "Introduction to the Estimation of Measurement Uncertainty"	-	There was nothing planned for the period under review, but the division received requests from the NLA to assist with the presentation of training courses
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	-	3	3	1. "Implementing a Shock Calibration System Using a Vibration Exciter and Pendulum", NCSLI Measure 2. "Implementation of an Accelerometer Transverse Sensitivity Measurement System", NCSLI Measure 3. "Secondary vibration calibration intercomparison, AFRIMETS.AUV. V-S3, Metrologia	-	Target met
		Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	-	5	10	Abstracts for presentations were successfully submitted to 2 international conferences. The Test and Measurement Conference was held from 6 to 9 October 2013. Five presentations were given and four posters were presented	-	Target exceeded. The division used the Test & Measurement Conference to showcase its development work to the South African metrology community

c. EM: Deliverables Achieved against Divisional Balance Score Card Targets

	Key Performance Outputs	Key Performance Indicator/ Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards maintained	25	25	25	NMS maintained per laboratory schedules; part of the TQMS	-	Target met
	New certified reference materials and methods of calibration and/or improved NMSs	New CRMs, measurements, methods of calibration as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMSs as listed in laboratory quality documentation	5	11	10	1. Fibre optic responsivity (60% complete) 2. Fibre optic wavelength in the L Band 3. Basic capabilities for LEDs: luminous flux 4. Basic capabilities for LEDs: Spectral properties 5. Thermal imagers: Calibration guidelines 6. Improved the RF power standard 7. Improved MC for RF attenuation 8. Improved MC for RF impedance 9. Improved traceability for ac/dc difference 10. Improved MC for impedance & improved MC for capacitance	96%	Measurement method and traceability chain developed. Equipment required purchased in 2013/14 (awaiting delivery). System to be established and tested in 2014
2	Demonstrated measurement capabilities	Number of calibration and measurement capabilities accepted in the International Key Comparison Database (KCDB)	208	210	214	Maintained 210 already accepted and added 4 new CMCs • 1 x Humidity CMC • 3 x Radiometry CMCs	-	Target exceeded
3	Dissemination of the NMS and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	New KPI	R3 042k	R1 652k	Calibrations performed for industry as requested	55%	External income target for calibration and consultation services exceeded by R170k (12%) Donor funding (R1 364k) for research projects not achieved within the period under review, due to resignations
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	-	-	-	Not applicable, only for Chemistry	-	No target set
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	-	2	2	Ms Jackline Omollo (KEBS) Mr Anectus Samuel (TBS)		Target met
		Number of courses developed and offered to industry	5	-	10	1. NLA UoM Course: 13–17 May 2013 2. NLA TF Course: 15–19 July 2013 3. NLA UoM Course: 29 Jul–2 Aug 2013 4. NLA RF Course: 2-6 Sept 2013 5. NLA UoM Course: 10-14 Feb 2014 6. NLA UoM Course: 24–28 Mar 2014 7. EM Frequency Lecture: 2 Jul 2013 8. EM Temperature Lecture: 13 Sep 2013 9. EM AC Power Lecture: 13 Feb 2014 10. EM LED Photometry Lecture: 25 Mar 2014		No target was set for 2013/14. The division introduced a series of lectures during 2013/14, through which it shared knowledge and experience in measurement science with industrial metrologists to meet the needs of their client base more successfully. Best practise in terms of measurement procedure, potential measurement errors and ways to minimise these, was presented. A total number of 10 courses was achieved. It is planned to maintain a rate of 5 courses to industry per financial year

c. EM: Deliverables Achieved against Divisional Balance Score Card Targets (CONTINUED)

	Key Performance Outputs	Key Performance Indicator/ Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	3	3	3	1. Dr A van Brakel, *"Improvement of calibration accuracy in fibre optic wavelength for DWDM applications"*, SAIP 2013 conference proceedings 2. CF Matthee, et al, *"Precise verification of a fibre link"*, SMEOS 2014 conference proceedings 3. JP Burger, et al, "*Theoretical analysis and systems design of two-photon-based optical frequency standards*", SMEOS 2014 conference proceedings	-	Target met
		Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	5	8	18	Oral presentations 1. *"CIE Division 2 technical committee TC 2-71 on CIE Standard on Test Methods for LED Lamps, Luminaires and Modules"*, R Sieberhagen, LED WG, 10 May 2013 2. Dr A van Brakel, *"Improvement of calibration accuracy in fibre optic wavelength for DWDM applications"*, SAIP 2013 3. *Temperature TAF*, Hans Liedberg, 14 June 2013 4. *"Fitting a curve to calibration data – a practical workshop, using an example from Thermometry"*, Hans Liedberg, T&M Conference, 8 Oct 2013 5. *"Results of 2013 SANAS National Interlaboratory Capacitance Comparison"*, Michael Khoza, T&M 2013 6. *DCLF and RF TAF*, Alexander Matlejoane, 17 October 2013 7. *"Traceability Of Spectrophotometric Measurements To The Highest Standard Of Calibration"*, Refuoe Pepenene, T&M 2013 8. NMISA DCLF-RF Technical Progress Report, Alexander Matlejoane, APMP TCEM, November 2013, Taipei 9. NMISA TF-FO Technical Progress Report, A van Brakel, APMP TCTF, November 2013, Taipei 10. NMISA PR Technical Progress Report, Rheinhardt Sieberhagen, APMP TCPR, November 2013, Taipei	-	Target exceeded. The division gave a number of presentations on energy-efficient lighting at the meetings of the SABS WG for Light Emitting Diodes, in order to share knowledge with lighting professionals. The division hosted 2 Technology Advisory Forums, which gave industry the opportunity to give input on the research and development strategies for temperature; and electrical and radio frequency national measurement capabilities

c. EM: Deliverables Achieved against Divisional Balance Score Card Targets (CONTINUED)

	Key Performance Outputs	Key Performance Indicator/ Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
						11. NMISA TH Technical Progress Report, Hans Liedberg, APMP TCT, November 2013, Taipei 12. *"Phosphor based-LEDs and Retinal Damage of the Eye"*, Lindani Tshibe, LED WG, 18 October 2013 13. *"The Natural Colour System (NCS)"*, Elsie Coetzee, SABS Symbolic Safety Sign Working Group (1), 10 October 2013 14. *"Precise Verification of a Fibre Link for Frequency Transfer"*, Chris Matthee, 3rd SMEOS Conference, 25 March 2014 15. *"Theoretical analysis and system design of two-photon-based optical frequency standards"*, Johan Burger, 3rd SMEOS Conference, 25 March 2014 Poster presentations 1. (#PP159): Coetzee, E.M., et al., *"Spectral Reflectance Measurements On Vervet Monkey Pelts"*, CIE Conference 2013, 12 – 19 April 2013, Paris, France 2. Pamela Silwana, *"Measurement of S-Parameters: Advances in Instrumentation at NMISA"*, NLA T&M 2013 3. *"Accurate Measurements for Modern Industries and Emerging Technologies in the PR Laboratory of NMISA"*, Margaret Budzinski, T&M 2013		

d. Ionising Radiation: Deliverables Achieved against Divisional Balance Score Card Targets

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards maintained	9	9	9	Maintained the number of gazetted National Measurement Standards	-	Target met
	New certified reference materials and methods of calibration and/or improved NMSs	New CRMs, measurements, methods of calibration as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMSs as listed in laboratory quality documentation	1	1	1	The primary standard measurement set-up of 4πβγ and TDCR counting systems was improved when 3 new linear amplifiers (ORTEC 610 models) were replaced. This is one of NMISA's primary measurement systems. The linear amplifiers were successfully tested and verified for the current counting system	-	Target met
2	Demonstrated measurement capabilities	Number of Calibration and Measurement Capabilities accepted in the International Key Comparison Database (KCDB)	37	37	37	Maintained the number of Calibration and Measurement Capabilities in KCDB	-	Target met
3	Dissemination of the NMS and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	-	647 800	573 587	Original figure not met but met revised target after mid-term review	89 %	The division faced challenges with the air-conditioning in one of the sections for 3 months, which hindered work. There was also a delay in the NNR Project, which is supposed to generate income for the division
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	-	-	-	-	-	No target set
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	2	1	-	-	-	The division trains metrologists from the region, as referred by the IAEA. During the period under review, there were no projects for the region and no training was offered. There was interaction with metrologists from the accredited laboratories, but no formal training was offered
		Number of courses developed and offered to industry	-	-	-	-	-	No target set
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	2	2	2	1. APMP/TCRI Key Comparison Report of Measurement of Air Kerma for 60Co Gamma-Rays (APMP.RI(I)-K1), published in Metrologia 50 2. First participation by NMISA in a low-level comparison: CCRI(II)-S9 exercise, published in applied radiation and isotopes journals (http://www.sciencedirect.com/science/article/pii/S0969804313000870)	-	Target met
		Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	8	4	6	Two presentations at the SAAPMB (local conference), One at the IAEA workshop, one at CCRI, CCRI(II) and CCRI RMO WG	-	Target exceeded. There was a request to present at the IAEA Workshop and, due to the national audit programme, which was to have started in 2014. Two papers were presented at the SAAPMB Congress

e. RTD: Deliverables Achieved against Divisional Balance Score Card Targets

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
1	Gazetted National Measurement Standards	Number of gazetted National Measurement Standards maintained	-	-	-	The services delivered by Materials Characterisation are included in the Chemistry Reference Materials and Reference Measurement Register	-	No target set
	New certified reference materials and methods of calibration and/or improved NMSs	New CRMs, measurements, methods of calibration as listed in NMISA Chemistry Reference Materials and Measurements Register and improved NMSs as listed in laboratory quality documentation	-	-	-	Materials Characterisation contributes to new CRMs via surface and structural analysis. It is reported under Chemistry	-	No target set
2	Demonstrated measurement capabilities	Number of calibration and measurement capabilities accepted in the International Key Comparison Database (KCDB)	1	1	1	Thermal silicon oxide on Si single crystal	-	Target met
3	Dissemination of the NMSs and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	New KPI	R855k	R458k	Generated through reference measurements provided to industry	54%	The major revenue earning instrument (the XPS) was out of commission for 7 months, due to breakages. The instrument is due for replacement in 2014
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	-	-	-	-	-	No target set
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	2	4	4	1. T Rampai, WITS 2. A Mwamba, MINTEK 3. J Steenkamp, UP 4. A Defunke, WITS	-	Target met
		Number of courses developed and offered to industry	-	-	-	Materials Characterisation mentors industry analysts in surface measurement, but these are not regarded as courses	-	No target set
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	5	3	4	1. C Oliphant et al, "EBSD analysis of tungsten-filament carburization during the hot-wire CVD of multi-walled carbon nanotubes" 2. L Adlem et al, "Size characterization of airborne SiO2 nano-particles: An interlaboratory comparison study", in collaboration with UP, NMMU and WITS 3. C Oliphant et al, "Characterization of silicon nitride thin films deposited by hot-wire CVD at low gas flow rates", in collaboration with UWC 4. W Jordaan et al, "CCQM-P140, Quantitative Analysis of CuInGaSe2 films", in collaboration with UWC	-	Target exceeded. The Photonics Group was removed from RTD in 2012/13, therefore the target was reduced to 3. The 4 remaining staff Members reached 4 publications in collaboration with UP, NMMU, WITS and UWC

e. RTD: Deliverables Achieved against Divisional Balance Score Card Targets (CONTINUED)

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
5.	Demonstrated competence and excellence in measurement via scientific outputs (continued)	Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	8	9	9	1. TIPS workshop, 29 May 2013, "Measurement Traceability, Metrology and NMISA" 2. ICCA 2013, "Identifying important differences in mass spectra generated by TOF-SIMS in a tribochemical study" 3. ICCA 2013, "Bio-degradation half-lives of gold nanoparticles" 4. AFRIMETS 6th GA, Lusaka, "AFRIMETS TC1 Update" 5. MSSA 2013, "Towards the Standardisation of Nanoparticle Size Analysis in an SEM" 6. T&M 2013, "Determination of Nitrogen content in SiNx thin films" 7. T&M 2013, "How to See and Measure a Nanoparticle" 8. SAGL AGM, "Traceable Accurate Measurement: The Cornerstone of Agro-Processing and Food Trade" 9. SACB GA, "Accurate Measurement, the key to Compliance"	-	Target met. Presentations and posters are aimed at either disseminating measurement information to industry or marketing the services of NMISA

f. TID: Deliverables Achieved against Divisional Balance Score Card Targets (TID contributes directly to Key Performance Outputs 3, 4 and 5)

	Key Performance Outputs	Key Performance Indicator/Measure	Baseline 2012/13	Target 2013/14	Actual Achieved	Deliverables Achieved	% Progress towards Target	Reason for Variance
3	Dissemination of the NMSs and measurement capabilities	Income generated via calibration services, sales, consultation, research grants and donor projects	New KPI	R650k	R2 558k	Generated through consultancy services to African NMIs and income from donor institutions, such as PTB Technical Cooperation and UNIDO	-	Target exceeded. TID was successful in coordinating extra donor funding for SADC activities from the PTB, TC and UNIDO
	Certified reference materials supplied to health, food, environment and the chemical sectors	Number of certified reference materials sold	-	-	-	-	-	No target set
4	A skilled and capable workforce for measurements in industry	Number of industry and/or regional metrologists trained in accurate measurement	38	30	61	Industry metrologists, regional metrologists and SMEs trained in measurement science at location and at trade shows	-	Target exceeded. In addition to the training of metrologists, trade shows were utilised to train SMEs and 31 additional training sessions were conducted at the Durban, PE and Cape Town trade shows
		Number of courses developed and offered to industry	1	1	0	Training video developed for SMEs in rural areas only 80% ready at the end of March 2014	80%	Training video developed to introduce SMEs to measurement science and its importance for business
5	Demonstrated competence and excellence in measurement via scientific outputs	Number of refereed and/or peer-reviewed publications on the development or improvement of measurements and measurement standards in journals and conference proceedings	5	3	1	1. D Masuku, "International Trade and the role of national quality infrastructure", SABS Standards Journal, Volume 2 No. 1 2. AFRIMETS JCRB Report, March 2014 3. AFRIMETS APMP Report	33%	Although the originally planned publications were delivered, only one is claimed in accordance with the rules of peer-reviewed publications
		Number of oral and/or poster presentations given at conferences and workshops on the improvement and development of measurements and measurement standards	8	9	6	1. Poster at SME Trade Show, Durban 2. Poster at SME Trade Show, PE 3. Poster at SME Expo, Cape Town 4. APMP Country Report at GA, oral presentation 5. SQAMEG Metrology Workshop, oral presentation, 24 March 2014 6. SADCMET Country Report, oral presentation, South Africa	67%	The Director of TID moved to RTD and delivered 3 presentations under RTD

PART 3

AUDIT REPORTS

3.1 REPORT BY THE AUDIT COMMITTEE

The Audit and Risk Committee is a sub-committee of the Board and is accountable to the Board. It derives its mandate from the Audit and Risk Committee Charter, Public Finance Management Act No. 1 of 1999, Treasury Regulations and King III code on Corporate Governance.

The Audit and Risk committee has a total of six (6) Members, consisting of four (4) Non-Executive Directors and two (2) external Members as well as the representative from the auditor-general as a standing invitee.

Audit and Risk Committee adopted formal Terms of Reference and the Committee Charter.

The composition of the Audit & Risk Committee is as follows:

- Ms Tshidi Molala - Chairperson and Board Member
- Dr Cleopas Sanangura - Non-Executive Director and Board Member
- Mr Tumi Seaketso - Non-Executive Director and Board Member
- Mr Tshokolo Nong - Non-Executive Director and Board Member
- Mr Kgosietsile Kgosiemang - External Member
- Ms Poni Ngwato - External Member

The committee was able to discharge all its responsibilities for the financial year as stipulated in the adopted terms of reference and committee charter.

The committee largely focused on the following:

1. Achieving a clean audit

The committee monitored controls necessary to achieve a clean audit. We are satisfied that controls relating to financial and non-financial information recording and reporting were adequately managed and efficient. This is evidenced by the external audit outcome as Part 3 of the Annual Report.

The committee wishes to congratulate Management of the NMISA for achieving an unqualified 'clean' audit. Management demonstrated commendable commitment to improve compliance and financial control environment.

2. Risk management

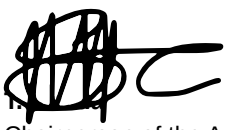
The committee was satisfied with the risk management policy and the risk register but we are of the view that the controls were insufficiently effective and efficient. The NMISA Enterprise-Wide risk management process requires specialized coordination and monitoring.

3. Information Technology

The committee also exercised oversight responsibilities over the adequacy, effectiveness and efficiency of Information Technology ("IT"). In light of IT weaknesses in control and approved IT projects, the committee resolved to form an IT Strategy Committee to overlook all IT projects and management of IT. Through reviews conducted by the Internal Audit Division, the committee was able to assess the adequacy, effectiveness and efficiency of internal controls. With the exception of noted control environment deficiencies, the committee is satisfied that internal controls in place are substantially adequate, effective and efficient to enable NMISA to achieve its objectives.

4. Evaluation of Financial Statements

The committee considered and satisfied itself that NMISA has the appropriate resources within the Finance Division. The annual financial statements for the year ending 31 March 2014, has been evaluated and based on the outcomes, the committee is satisfied that Annual Financial Statements complies in all material respect with the applicable accounting standards.



Chairperson of the Audit and Risk Committee

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Building a better working world

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INDEPENDENT AUDITOR'S REPORT TO PARLIAMENT ON THE NATIONAL METROLOGY INSTITUTE OF SOUTH AFRICA

REPORT ON THE FINANCIAL STATEMENTS

Introduction

We have audited the financial statements of the National Metrology Institute of South Africa set out on pages 56 to 87, which comprise the statement of financial position as at 31 March 2014, the statement of financial performance, statement of changes in net assets and cash flow statement for the year then ended, as well as the notes, comprising a summary of significant accounting policies and other explanatory information.

Accounting Authority's responsibility for the financial statements

The board of directors, which constitutes the accounting authority is responsible for the preparation and fair presentation of these financial statements in accordance with Standards of Generally Recognised Accounting Practice and the requirements of the Public Finance Management Act of South Africa, and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Public Audit Act of South Africa, the general notice issued in terms thereof and International Standards on Auditing. Those standards require that we comply with ethical requirements, and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of the National Metrology Institute of South Africa as at 31 March 2014 and its financial performance and cash flows for the year then ended, in accordance with Standards of Generally Recognised Accounting Practice and the requirements of the Public Finance Management Act of South Africa.

REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

In accordance with the PAA and the general notice issued in terms thereof, we report the following findings on the reported performance information against predetermined objectives for the objectives presented in the annual report, non-compliance with legislation as well as internal control. We performed tests to identify reportable findings as described under each subheading but not to gather evidence to express assurance on these matters. Accordingly, we do not express an opinion or conclusion on these matters.

Predetermined objectives

We performed procedures to obtain evidence about the usefulness and reliability of the reported performance information for the following objectives presented in the annual performance report of the National Metrology Institute of South Africa for the year ended 31 March 2014:

- Objective 1: Keep and maintain the equipment necessary to achieve national measurement standards and certify reference materials on page 37

- Objective 2: Upgrade the existing measurement standards, develop new measurement standards and reference materials in-line with the requirements of commerce and industry on page 37
- Objective 3: Establish confidence in the accuracy of the national measurement standards, through suitable and documented verification processes on page 37
- Objective 4: Disseminate traceability and measurement expertise and services to South African commerce and industry, by means of calibration, measurement or analysis, certified reference materials, appropriate technology and skills transfer on page 37
- Objective 5: Establish and maintain the necessary expertise and competence according to internationally-accepted standards on page 38

We evaluated the reported performance information against the overall criteria of usefulness and reliability.

We evaluated the usefulness of the reported performance information to determine whether it was presented in accordance with the National Treasury's annual reporting principles and whether the reported performance was consistent with the planned objectives. We further performed tests to determine whether indicators and targets were well defined, verifiable, specific, measurable, time bound and relevant, as required by the National Treasury's *Framework for managing programme performance information* (FMPPI).

We assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

We did not raise any material findings on the usefulness and reliability of the reported performance information for the selected objectives.

Additional matter

Although we raised no material findings on the usefulness and reliability of the reported performance information for the selected objectives, we draw attention to the following matter:

Achievement of planned targets

Refer to the annual performance report on pages 37 to 39 for information on the achievement of planned targets for the year.

Compliance with laws and regulations

We performed procedures to obtain evidence that the entity had complied with legislation regarding financial matters, financial management and other related matters.

We did not identify any instances of material non-compliance with specific matters in key legislation, as set out in the general notice issued in terms of the Public Audit Act, 2004 (Act No. 25 of 2004) (PAA).

Internal control

We considered internal control relevant to our audit of the financial statements, performance report and compliance with laws and regulations.

Matters of internal control considered are limited to significant deficiencies that would result in a basis for a modification of the audit opinion, or any findings reported with regard to the performance report, or any matters identified as non-compliance with laws and regulations included in this report.

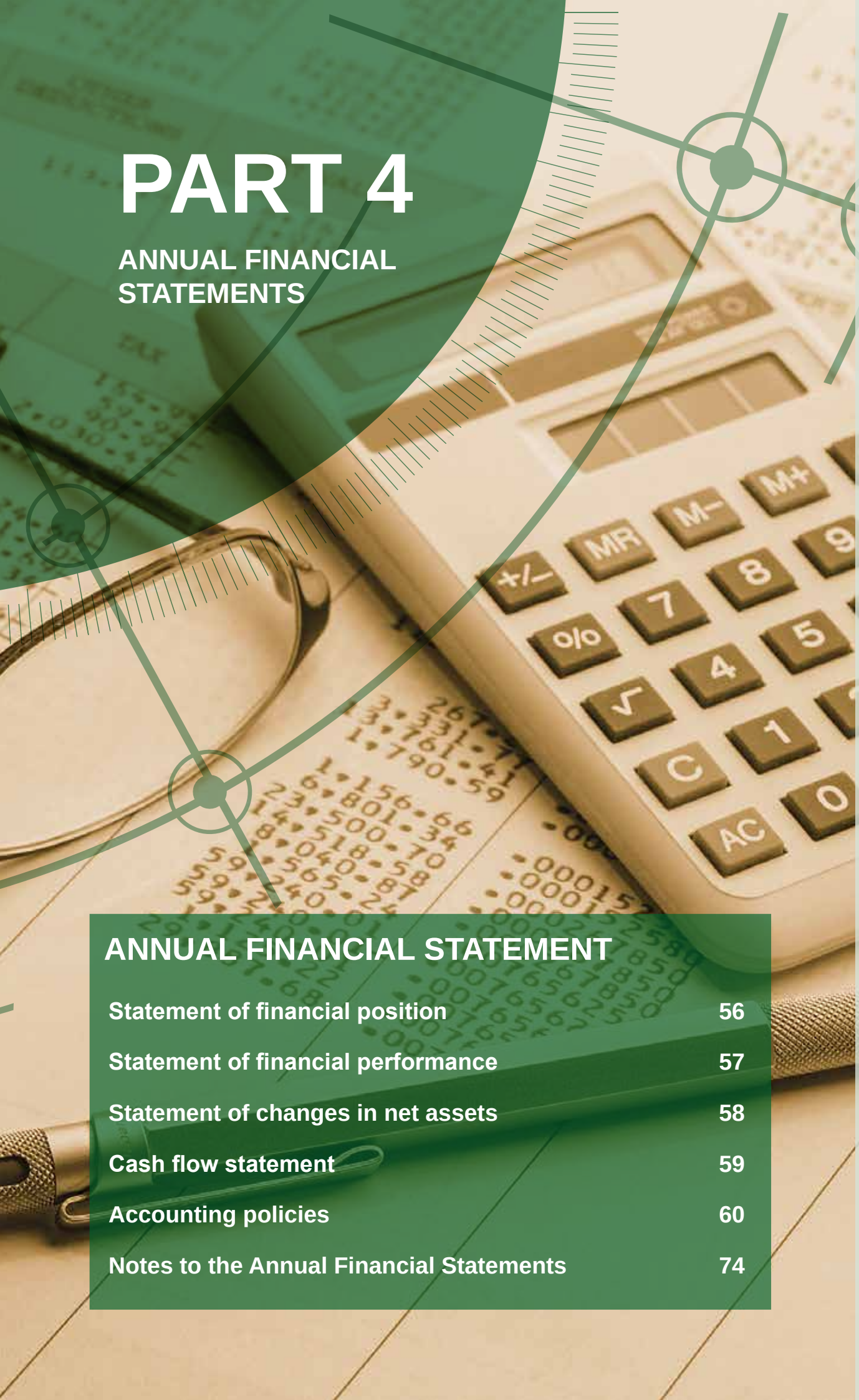
Consequently, as no matters were reported, we did not identify any significant deficiencies in internal control.

Ernst & Young Inc.

Director – Kuben Moodley
Registered auditor
Chartered Accountant (SA)
30 July 2014

PART 4

ANNUAL FINANCIAL STATEMENTS



ANNUAL FINANCIAL STATEMENT

STATEMENT OF FINANCIAL POSITION

as at 31 March 2014

	Note(s)	2014 R	Restated 2013 R
Assets			
Current Assets		**98 668 724**	**41 453 931**
Receivables from exchange transactions	2	3 576 759	2 183 971
Other receivables from non-exchange transactions	3	38 417	22 524
Cash and cash equivalents	4	95 053 548	39 247 436
Non-current Assets		**76 881 981**	**70 670 388**
Property, plant and equipment	5	76 006 928	69 361 167
Intangible assets	6	428 315	862 483
Rental deposit		446 738	446 738
Total Assets		**175 550 705**	**112 124 319**
Net Assets and Liabilities			
Net Assets			
Accumulated surplus		167 069 114	105 531 615
Current Liabilities		**8 481 591**	**6 592 704**
Payables from exchange transactions	7	6 495 985	3 786 751
Other payables from non-exchange transactions	8	1 985 606	2 805 953
Non-current Liabilities			
Total Liabilities		**8 481 591**	**6 592 704**
Total Net Assets and Liabilities		**175 550 705**	**112 124 319**

STATEMENT OF FINANCIAL PERFORMANCE

for the year ended 31 March 2014

	Note(s)	Actual 31 March 2014 R	Approved/ Final Annual Budget 2013/14 R	Note(s)	Variances R	% Variance	Restated 31 March 2013 R
Revenue		**159 951 084**	**157 803 000**		**(2 148 084)**	**(1%)**	**92 632 992**
Non-exchange revenue		145 942 000	145 942 000		-		82 233 000
Transfer	9	145 942 000	145 942 000		-		82 233 000
Exchange revenue		14 009 084	11 861 000		(2 148 084)		10 399 992
Rendering of services	9	10 083 202	10 600 000		516 798	5%	7 879 218
Interest income		3 569 397	1 261 000	25.1	(2 308 397)	(183%)	2 126 761
Other income	10	356 485	-	25.2	(356 485)	(100%)	394 013
Expenditure		**(98 249 603)**	**(157 653 000)**		**(59 403 397)**		**(84 293 260)**
Employee-related expenses	**11**	(50 534 466)	(55 094 792)		(4 560 326)	8%	(48 187 156)
Operating expenses	12	(33 149 001)	(78 914 208)	25.3	(45 765 207)	58%	(23 854 079)
Depreciation and amortisation	5,6	(10 771 702)	(20 524 000)	25.4	(9 752 298)	48%	(8 852 850)
Credit losses	13	(61 672)	-	25.5	61 672	(100%)	(208 999)
Repairs and maintenance		(3 426 650)	(2 693 000)	25.6	733 650	(27%)	(2 840 536)
Contracted services		(62 731)	(427 000)	25.7	(364 269)	85%	(52 959)
Loss on disposal of assets		(243 381)	-	25.8	243 381	(100%)	(296 681)
Foreign exchange gain/(loss)		(163 982)	(150 000)	25.9	13 982	(9%)	35 514
Surplus/(deficit) for the Year		**61 537 499**	**-**		**(61 537 499)**		**8 375 246**

The variances are explained under Note 25. During the financial year, no adjustments were made to the budgets; the approved budget is final.

STATEMENT OF CHANGES IN NET ASSETS

for the year ended 31 March 2014

	Note(s)	Accumulated Surplus R	Total Net Assets R
Restated balance as at 31 March 2011		**73 130 226**	**73 130 226**
Changes in net assets			
Surplus/(deficit) for the year as previously reported		23 272 712	23 272 712
Prior period error	14	753 431	753 431
Restated balance as at 31 March 2012		**97 156 369**	**97 156 369**
Changes in net assets			
Surplus/(deficit) for the year as previously reported		8 111 102	8 111 102
Prior period error	14	264 144	264 144
Restated balance as at 31 March 2013		**105 531 615**	**105 531 615**
Changes in net assets			
Surplus/(deficit) for the year		61 537 499	61 537 499
Balance as at 31 March 2014		**167 069 114**	**167 069 114**

CASH FLOW STATEMENT

for the year ended 31 March 2014

	Note(s)	2014 R	Restated 2013 R
Cash flows from operating activities			
Receipts		**158 992 563**	**92 632 992**
Rendering of services		9 034 325	8 273 231
Transfer	9	145 942 000	82 233 000
Other income		265 457	-
Interest income		3 750 781	2 126 761
Payments		**(86 526 003)**	**(72 618 173)**
Employee-related costs		(52 118 227)	(48 187 156)
Suppliers		(34 407 776)	(24 431 017)
Net cash flows from operating activities	**15**	**72 466 560**	**20 014 819**
Cash flows from investing activities			
Purchase of property, plant and equipment		(16 628 824)	(16 877 579)
Purchase of other intangible assets	6	(80 150)	(945 008)
Proceeds from sale of assets		48 526	-
Net cash flows from investing activities		**(16 660 448)**	**(17 822 587)**
Net increase/(decrease) in cash and cash equivalents		**55 806 112**	**2 192 232**
Cash and cash equivalents at the beginning of the year		39 247 436	37 055 204
Cash and cash equivalents at the end of the year	**4**	**95 053 548**	**39 247 436**

ACCOUNTING POLICIES

i. Presentation of Annual Financial Statements

1. Basis of preparation

The annual financial statements were prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP), including any interpretations, guidelines and directives issued by the Accounting Standards Board in accordance with Section 55 (1) (b) of the Public Finance Management Act, 1999 (Act No. 1 of 1999) (PFMA), as amended.

These annual financial statements were prepared on an accrual basis of accounting and are in accordance with historical cost convention unless specified otherwise. They are presented in South African Rand, which is NMISA's functional currency. Amounts in the financial statements are rounded to the nearest rand.

During the financial year under review, the following GRAP Standard was adopted by NMISA:

- GRAP 25 – Employee Benefits

The adoption of this newly effected GRAP Standard did not have a significant impact on the financial statements, as the principles are similar to those already applied in terms of this standard in the presentation of the financial statements.

Judgements, estimates and assumptions

The preparation of the financial statements, in conformity with GRAP, requires management to make judgements, estimates and assumptions that affect the application of accounting policies. Refer to Note 25.

Going concern

The financial statements were prepared on the assumption that the entity is a going concern and will continue to be in operation for the foreseeable future.

A summary of the significant accounting policies, which were consistently applied, are disclosed below.

2. Property, plant and equipment

Property, plant and equipment are tangible non-current assets (including infrastructure assets) that are held for use in the production or supply of goods or services, rental to others, or for administrative purposes, and are expected to be used during more than one period. This excludes investment property.

The cost of an item of property, plant and equipment is the purchase price and other costs attributable to bring the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Trade discounts and rebates are deducted in arriving at the cost.

The cost of an item of property, plant and equipment, is recognised as an asset when:

- it is probable that future economic benefits or service potential associated with the item will flow to the entity; and
- the cost of the item can be measured reliably.

Property, plant and equipment are initially measured at cost.

Where an asset is acquired at no cost or at a nominal cost, its cost is its fair value as at the date of acquisition.

Where an item of property, plant and equipment is acquired in exchange for a non-monetary asset or monetary assets, or a combination of monetary and non-monetary assets, the asset acquired is initially measured at fair value (the cost). If the acquired item's fair value was not determinable, its deemed cost is the carrying amount of the asset(s) given up.

When significant components of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of it, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located, is also included in the cost of property, plant and equipment, where the entity is obligated to incur such expenditure; and where the obligation arises as a result of acquiring the asset or using it for purposes other than the production of inventories.

Recognition of costs in the carrying amount of an item of property, plant and equipment ceases when the item is in the location and condition necessary for it to be capable of operating in the manner intended by management.

Property, plant and equipment are carried at cost, less accumulated depreciation and any impairment losses.

Property, plant and equipment are depreciated on the straight line basis over their expected useful lives to their estimated residual value.

Property, plant and equipment are carried at cost, less accumulated depreciation and any impairment losses. The useful lives of items of property, plant and equipment were assessed as follows:

Property, plant and equipment

Item	Useful life in years
Furniture and fittings	1 to 10
Office equipment	5 to 30
Plant and equipment	5 to 30
Motor vehicles	5 to 10
Leasehold improvements	Lease period

The residual value and the useful life and depreciation method of each asset are reviewed at the end of each reporting date. If the expectations differ from previous estimates, the change is accounted for as a change in accounting estimate.

Reviewing the useful life of an asset on an annual basis, does not require the entity to amend the previous estimate, unless expectations differ from the previous estimate.

Each part of an item of property, plant and equipment, with a cost that is significant in relation to the total cost of the item, is depreciated separately.

The depreciation charge for each period is recognised in surplus or deficit, unless it is included in the carrying amount of another asset.

Items of property, plant and equipment are derecognised when the asset is disposed of or when there are no further economic benefits or service potential expected from the use of the asset.

The gain or losses arising from derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

Leasehold improvements

The cost of leasehold improvements is depreciated over the period of the lease contract.

3. Intangible assets

An asset is identified as an intangible asset, when it:

- is capable of being separated or divided from the entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, asset or liability; or
- arises from contractual rights or other legal rights, regardless of whether those rights are transferable or separate from the entity or from other rights and obligations.

An intangible asset is recognised when:

- it is probable that the expected future economic benefits or service potential that are attributable to the asset will flow to the entity; and
- the cost or fair value of the asset can be measured reliably.

Intangible assets are initially recognised at cost. The cost of intangible assets is the purchase price and other costs attributable to bring the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Trade discounts and rebates are deducted in arriving at the cost.

An intangible asset is regarded as having an indefinite useful life when, based on all relevant factors, there is no foreseeable limit to the period over which the asset is expected to generate net cash inflows or service potential. Amortisation is not provided for these intangible assets, but they are tested for impairment annually and whenever there is an indication that the asset may be impaired. For all other intangible assets amortisation is provided on a straight line basis over their useful life.

The amortisation period and the amortisation method for intangible assets are reviewed at each reporting date.

Reassessing the useful life of an intangible asset with a finite useful life after it was classified as indefinite, is an indicator that the asset may be impaired. As a result, the asset is tested for impairment and the remaining carrying amount is amortised over its useful life.

Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance are not recognised as intangible assets.

Amortisation is provided to write down the intangible assets, on a straight line basis over their useful lives, as follows:

Intangible assets

Item	Useful life in years
Computer software	2

Items of intangible assets are derecognised at the carrying amount when the intangible asset is disposed of or when there are no further economic benefits or service potential expected from the use of the intangible asset.

The gain or loss arising from derecognition of an item of intangible asset is included in surplus or deficit when the item is derecognised. The gain or loss arising from derecognition of an item of intangible asset is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

4. Financial instruments

A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or a residual interest of another entity.

The amortised cost of a financial asset or financial liability is the amount at which the financial asset or financial liability is measured at initial recognition, minus principal repayments, plus or minus the cumulative amortisation, using the effective interest method of any difference between that initial amount and the maturity amount, and minus any reduction (directly or through the use of an allowance account) for impairment or uncollectability.

Risk management of financial assets and liabilities

NMISA's activities expose it to a variety of financial risks, as set out below. For management of risk exposure refer to Note 22.

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.

Currency risk is the risk that the fair value or future cash flow of a financial instrument will fluctuate due to changes in foreign exchange rates.

Interest rate risk is the risk that the fair value or future cash flow of a financial instrument will fluctuate due to changes in market interest rates.

Liquidity risk is the risk encountered by an entity in the event of difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset.

Market risk is the risk that the fair value or future cash flow of a financial instrument will fluctuate due to changes in market prices. Market risk comprises three types of risk, namely currency risk, interest rate risk and other price risk.

Other price risk is the risk that the fair value or future cash flow of a financial instrument will fluctuate due to changes in market prices (other than those arising from interest rate risk or currency risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market.

Initial measurement of financial assets and financial liabilities

The entity measures a financial asset and financial liability initially at its fair value, plus transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability.

Subsequent measurement of financial assets and financial liabilities

The entity measures all financial assets and financial liabilities after initial recognition, using the following category:

- Financial instruments at amortised cost

All financial assets measured at amortised cost are subject to an impairment review.

Impairment and uncollectability of financial assets

The entity assesses at the end of each reporting period, whether there is any objective evidence that a financial asset or group of financial assets is impaired.

A financial asset or a group of financial assets is impaired and impairment losses are incurred if, and only if, there is objective evidence of impairment as a result of one or more events that occurred after the initial recognition of the asset (a loss event) and that loss event (or events) has an impact on the estimated future cash flow of the financial asset or group of financial assets that can be reliably estimated.

It may not be possible to identify a single, discrete event that caused the impairment, since it may have been the combined effect of several events that did so. Losses expected as a result of future events, no matter how likely, are not recognised. The entity first assesses whether objective evidence of impairment exists individually for financial assets that are individually significant, and then follows a portfolio approach with the remaining financial assets.

The impairment loss estimates equal the best estimates within a range of long outstanding assets with similar credit risk characteristics.

If there is objective evidence that an impairment loss on financial assets, measured at amortised cost, was incurred, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flow (excluding future credit losses that have not been incurred) discounted at the financial asset's original effective interest rate. The carrying amount of the asset is reduced directly or through the use of an allowance account. The amount of the loss is recognised in surplus or deficit.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, the previously recognised impairment loss is reversed directly or by adjusting an allowance account. The reversal does not result in a carrying amount of the financial asset that exceeds what the amortised cost would have been had the impairment not been recognised at the date the impairment is reversed. The amount of the reversal is recognised in surplus or deficit.

Derecognition

Derecognition of financial assets

The entity derecognises a financial asset only when:

- the contractual rights to the cash flow from the financial asset expire, are settled or waived;
- the entity transfers to another party substantially all of the risks and rewards of ownership of the financial assets; or
- the entity, despite having retained some significant risks and rewards of ownership of the financial asset, has transferred control of the asset to another party and the other party has the practical ability to sell the asset in its entirety to an unrelated third party and is able to exercise that ability unilaterally and without needing to impose additional restrictions on the transfer.

Derecognition of financial liability

The entity derecognises financial liabilities when, and only when, the entity's obligations are discharged, cancelled or when they expire.

5. Financial assets

NMISA's principle financial assets are trade and other receivables and cash and cash equivalents.

Trade and other receivables

Trade and other receivables are classified as financial assets at amortised cost. A provision for impairment of trade receivables is established when there is objective evidence that the entity will not be able to collect all amounts due, according to the original terms of receivables.

Cash and cash equivalents

Cash and cash equivalents comprise cash on hand and deposits held at call with banks and are classified as financial assets at amortised cost.

6. Financial liabilities

NMISA's principle financial liabilities are trade and other payables.

Trade and other payables

Trade and other payables are classified as financial liabilities at amortised cost.

7. Leases

A lease is classified as a finance lease if it transfers substantially all the risks and rewards incidental to ownership. A lease is classified as an operating lease if it does not transfer substantially all the risks and rewards incidental to ownership.

When a lease includes land and building elements, the entity assesses the classification of each element separately.

Operating leases – lessee

Operating lease payments are recognised as an expense on a straight line basis over the lease term. The difference between the amounts recognised as an expense and the contractual payments are recognised as an operating lease asset or liability.

8. Revenue from exchange transactions

Revenue is the gross inflow of economic benefits or service potential during the reporting period when those inflows result in an increase in net assets, other than increases relating to contributions from owners.

An exchange transaction is one in which the entity receives assets or services, or has liabilities extinguished, and directly gives approximately equal value (primarily in the form of goods, services or use of assets) to the other party in exchange.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

9. Rendering of services

When the outcome of a transaction involving the rendering of services can be estimated reliably, revenue associated with the transaction is recognised by reference to the stage of completion of the transaction at the reporting date. The outcome of a transaction can be estimated reliably when all the following conditions are satisfied:

- the amount of revenue can be measured reliably;
- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity;
- the stage of completion of the transaction at the reporting date can be measured reliably; and
- the costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

When the outcome of the transaction involving the rendering of services cannot be estimated reliably, revenue is recognised only to the extent of the expenses recognised that are recoverable.

Service revenue is recognised by reference to the stage of completion of the transaction at the reporting date. Stage of completion is determined by services performed to date as a percentage of total services to be performed.

10. Interest and royalties

Revenue arising from the use by others of entity assets yielding interest and royalties is recognised when:

- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity; and
- the amount of the revenue can be measured reliably.

Interest is recognised, in surplus or deficit, using the effective interest rate method.

Royalties are recognised as they are earned in accordance with the substance of the relevant agreements.

Service fees included in the price of the product are recognised as revenue over the period during which the service is performed.

11. Revenue from non-exchange transactions

Non-exchange transactions are transactions that are not exchange transactions. In a non-exchange transaction, an entity either receives value from another entity without directly giving approximately equal value in exchange, or gives value to another entity without directly receiving approximately equal value in exchange.

Stipulations on transferred assets are terms in laws or regulations, or a binding arrangement imposed upon the use of a transferred asset by entities external to the reporting entity. For conditions not met, a liability is raised. Revenue is recognised as and when conditions are met by decreasing the liability. An inflow of resources from a non-exchange transaction recognised as an asset is recognised as revenue, except to the extent that a liability is also recognised for the same inflow.

Revenue from a non-exchange transaction is measured at the amount of the increase in net assets recognised by the entity. NMISA receives an unconditional grant via the Department of Trade and Industry (the dti).

12. Provisions, commitments and contingencies

Provisions

A provision is a liability where the timing or amount of the outflow of resources, embodying economic benefits or service potential is uncertain.

A provision is recognised when:

- the entity has a present obligation (legal or constructive) as a result of a past event;
- it is probable that an outflow of resources, embodying economic benefits or service potential, will be required to settle the obligation; and
- a reliable estimate can be made of the amount of the obligation.

The amount of a provision is the best estimate of the expenditure expected to be required to settle the present obligation at the reporting date.

Where the effect of the time value of money is material, the amount of a provision shall be the present value of the expenditure expected to be required to settle the present obligation. The discount rate shall reflect current market assessments of the time value of money and risks specific to the liability.

The entity reviews provisions at each reporting date, and adjusts them if necessary, to reflect the current best estimate. Provisions are reversed if it is no longer probable that an outflow of resources, embodying economic benefits or service potential, will be required to settle the obligation. Where discounting is used, the carrying amount of a provision increases in each period to reflect the passage of time. This increase is recognised as an interest expense.

13. Commitments

A commitment is an agreement between two or more parties that is binding on those parties, to the degree that to renege on the agreement will be costly.

Commitments represent the orders issued to the suppliers that had been approved, but where no delivery has taken place as at year-end, as well as non-contractual commitments.

Commitments are not recognised in the statement of financial position as liabilities and assets but are included in the notes to the annual financial statements.

The entity discloses the amount of contractual commitments for the acquisition of property, plant and equipment and intangible assets.

14. Contingent liabilities

A contingent liability is a possible obligation that arises from past events and the existence of which will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events that are beyond the control of the entity.

Alternatively, a contingent liability is a present obligation that arises from past events but is not recognised because:

- it is not probable that an outflow of resources, embodying economic benefits or service potential, will be required to settle the obligation; or
- the amount of the obligation cannot be measured with sufficient reliability.

Contingent liabilities are included in the notes to the annual financial statements. The estimation of the amounts disclosed is based on the expected possible outflow of economic benefits, should there be a present obligation.

15. Contingent assets

Contingent assets arise from unplanned or other unexpected events that are not wholly within the control of the entity and give rise to the possibility of an inflow of economic benefits or service potential to the entity.

Contingent assets are included in the notes to the annual financial statements. The estimation of the amounts disclosed is based on the expected possible inflow of economic benefits or service potential to the entity.

Contingent assets and contingent liabilities are not recognised as provisions, as the recognition criteria are not complied with.

16. Changes in estimates and prior period errors

Changes in estimates

Estimates involve judgement based on recently available, reliable information and therefore an estimate may change as new information becomes known, circumstances change or more experience is obtained.

The entity recognises the effects of changes in accounting estimates prospectively, by including the effects in surplus or deficit in the period of the change if the change affects that period only or in the period of the change and future periods, if the change affects both.

Prior period errors

Prior period errors are omissions from, and misstatements in, the entity's financial statements for one or more prior periods, arising from a failure to use (or misuse of) reliable information that was available when the financial statements for those periods were authorised for issue and could reasonably be expected to have been obtained and taken into account in the preparation and presentation of those financial statements.

Such errors include the effect of mistakes in applying the accounting policy, oversight or misinterpretation of facts.

Prior period errors identified are corrected retrospectively as an adjustment to the carrying amount of assets or liabilities and offset to the opening balance of accumulated surplus. The prior period error notes in the annual financial statements will disclose the effect of the correction, as well as the cumulative effect on the change in net assets.

17. Events after the reporting period

Events after the reporting period are those events, favourable and unfavourable, that occur between the end of the reporting period and the date when the financial statements are authorised for issue.

The entity adjusts the amounts recognised in its financial statements to reflect conditions that existed at the end of the reporting period (adjusting events after reporting date) prior to authorisation for issue.

If non-adjusting events after the reporting date are material, the entity will disclose the following for each material category of non-adjusting event after the reporting date:

- the nature of the event; and
- an estimate of its financial impact or a statement that such estimate cannot be made.

18. Standards of GRAP approved but not yet effective

Effect of New GRAP Standards

The following approved Standards of GRAP have been issued, but are not yet effective:

Standard number	Standard name	Effective date
GRAP 18	Segment Reporting	No effective date
GRAP 20	Related Party Disclosures	No effective date
GRAP 32	Service Concession Arrangements: Grantor	No effective date
GRAP 105	Transfer of Functions Between Entities Under Common Control	No effective date
GRAP 106	Transfer of Functions Between Entities Not Under Common Control	No effective date
GRAP 107	Mergers	No effective date
GRAP 108	Statutory Receivables	No effective date

GRAP 18 – Segment Reporting

The standard requires the identification and aggregation of the operating segments of the entity into reportable segments. For each of the reportable segments identified, details of the financial performance and financial position will be disclosed. The entity does not have operating segments and, accordingly, the adoption of this standard will have no material impact on the financial statements. This standard does not yet have an effective date.

GRAP 20 – Related Party Disclosures

This standard provides the requirements for the disclosure of related parties and transactions and balances with related parties. This standard was based on IPSAS 20, as currently applied by the entity for its related party disclosures.

Accordingly, it is not expected that the adoption of this standard will have a material impact on the financial statements of the entity. This standard does not yet have an effective date.

GRAP 32 – Service Concession Agreements: Grantor

This standard applies to a contractual agreement between a grantor and an operator in which the operator uses the service concession asset to provide a mandated function on behalf of the grantor for a specified period of time. The standard requires that the grantor shall recognise an asset provided by the operator as a service concession asset if the grantor controls or regulates what services the operator provides. NMISA does not currently have any Service Concession Agreements, therefore this standard is not expected to have an impact. No effective date has been determined by the Minister of Finance.

GRAP 105 – Transfer of Functions Between Entities Under Common Control

This standard provides the accounting treatment for transfers of functions between entities under common control. The standard determines that assets and liabilities transferred to entities under common control will be recognised at their carrying values (per the records of the transferring entity) in the records of the receiving entity. The difference between the consideration transferred and the carrying value of the assets/liabilities transferred is recognised in accumulated surplus/deficit. There are currently no transfers of functions in NMISA, therefore this standard is not expected to have an impact. This standard does not yet have an effective date.

GRAP 106 – Transfer of Functions Between Entities Not Under Common Control

This standard deals with other transfers of functions between entities not under common control and requires the entity to measure transferred assets and liabilities at fair value. The difference between the consideration transferred and the carrying value of the assets/liabilities transferred is recognised in accumulated surplus/deficit.

There are currently no transfers of functions in NMISA, therefore this standard is not expected to have an impact. This standard does not yet have an effective date.

GRAP 107 – Mergers

This standard deals with requirements for accounting for a merger between two or more entities. The standard determines that the assets and liabilities acquired through the merger should be measured at their carrying values. Any difference between these carrying values and the consideration transferred for the merger is recognised in accumulated surplus/deficit. NMISA has not entered into a merger. This standard does not yet have an effective date.

GRAP 108 – Statutory Receivables

This standard provides for the accounting treatment of statutory receivables. The statutory receivables in the public sector can arise from contracts of legislative requirements. Receivables are recognised, based on the transaction (GRAP 9) – i.e. either exchange transactions or non-exchange (GRAP 23), and if the transaction is out of the scope of the two standards listed above, then the receivable can only be recognised when the definition of an asset is met. No effective date has been determined by the Minister of Finance.

Interpretations Issued

The following interpretations were also issued and are expected to have an insignificant impact on the financial statements, since they generally reflect the interpretation and principles already established in terms of GRAP. It is unlikely that the entity will encounter any of these issues in the normal course of its business.

Interpretation number	Interpretation name	Effective date
	Preface to Interpretations of the Standards of GRAP	No effective date
iGRAP 1	Applying the Probability Test on Initial Recognition of Revenue	1 April 2013
iGRAP 7	The Limit on a Defined Benefit Asset, Minimum Funding Requirements and their Interaction	No effective date
iGRAP 11	Consolidation – Special Purpose Entities	No effective date
iGRAP 12	Jointly Controlled Entities – Non-nonetary Contributions By Venturers	No effective date
iGRAP 16	Intangible Assets – Website Costs	1 April 2013
iGRAP 17	Interpretation of the Standard of GRAP on Service Concession Arrangements Where a Grantor Controls a Significant Residual Interest in an Asset	No effective date

19. Presentation of budget information

Budgets are prepared on an accrual basis over the 12-months period of the financial year.

NMISA presents a comparison of the budget and actual amount as an additional column in the primary financial statements. The reasons for any variances are disclosed in the notes to the annual financial statements.

20. Related parties

Parties are considered to be related if one party has the ability to control the other party or exercise significant influence over the other party in making financial and operating decisions or if the related party and another party are subject to common control. Related parties include individuals who have significant influence over the entity, such as Members of the Board and key management personnel. Only transactions between NMISA and related parties during the reporting period, not on ordinary terms or not in the ordinary course of business, as well as comparative information are disclosed in the notes to the annual financial statements.

21. Impairment of non-financial assets (cash-generating assets)

Assets are classified as cash-generating if the entity intends to generate positive cash inflows from the asset and earn a commercial return that reflects the risk involved in holding the asset. Non-cash generating assets are primarily held for service delivery purposes in terms of NMISA's mandate.

At each reporting date, the entity reviews the carrying amounts of its tangible and intangible assets to determine whether there is any indication that those assets have suffered an impairment loss. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss (if any). The recoverable amount is the higher of fair value less costs to sell and value in use. In assessing value in use, the estimated future cash flow is discounted to its present value, using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the assets.

If the recoverable amount of an asset is estimated to be less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. An impairment loss is recognised immediately as an expense.

Where an impairment loss subsequently reverses, the carrying amount of an asset is increased to the revised estimate of its recoverable amount, but so that the increased carrying amount does not exceed the carrying amount that would have been determined had no impairment loss been recognised for the asset in prior years. A reversal of an impairment loss is recognised immediately as income.

22. Impairment of non-financial assets (non-cash-generating assets)

Non-cash-generating assets are assets other than cash-generating assets. When the carrying amount of a non-cash-generating asset exceeds its recoverable service amount, it is impaired. At each reporting date, the entity assesses whether there is any indication that a non-cash-generating asset may be impaired.

If any such indication exists, an entity estimates the recoverable service amount of the asset.

The present value of the remaining service potential of a non-cash-generating asset is determined, using one of the following approaches:

- depreciated replacement cost approach;
- restoration cost approach; and
- service units approach.

If the recoverable service amount of a non-cash-generating asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable service amount. This reduction is an impairment loss. An impairment loss is recognised immediately in surplus or deficit.

At each reporting date, the entity assesses whether there is any indication that an impairment loss, recognised in prior periods for a non-cash-generating asset, may no longer exist or may have decreased. If any such indication exists, the entity estimates the recoverable service amount of that asset.

A reversal of an impairment loss for a non-cash-generating asset is recognised immediately in surplus or deficit.

23. Rental deposits

The rental deposit is disclosed as a long-term receivable in the annual financial statements of the entity. The rental deposit is refundable to the lessee at the end of the lease term.

24. Employee benefits

Short-term employee benefits

The cost of short-term employee benefits, those payable within 12 months after the service is rendered, such as paid vacation leave and sick leave, bonuses and non-monetary benefits (such as medical care), are recognised in the period in which the service is rendered and are not discounted.

Defined contribution plan

Payments to defined contribution retirement benefit plans are charged as an expense as they fall due.

25. Significant judgements and sources of estimation uncertainty

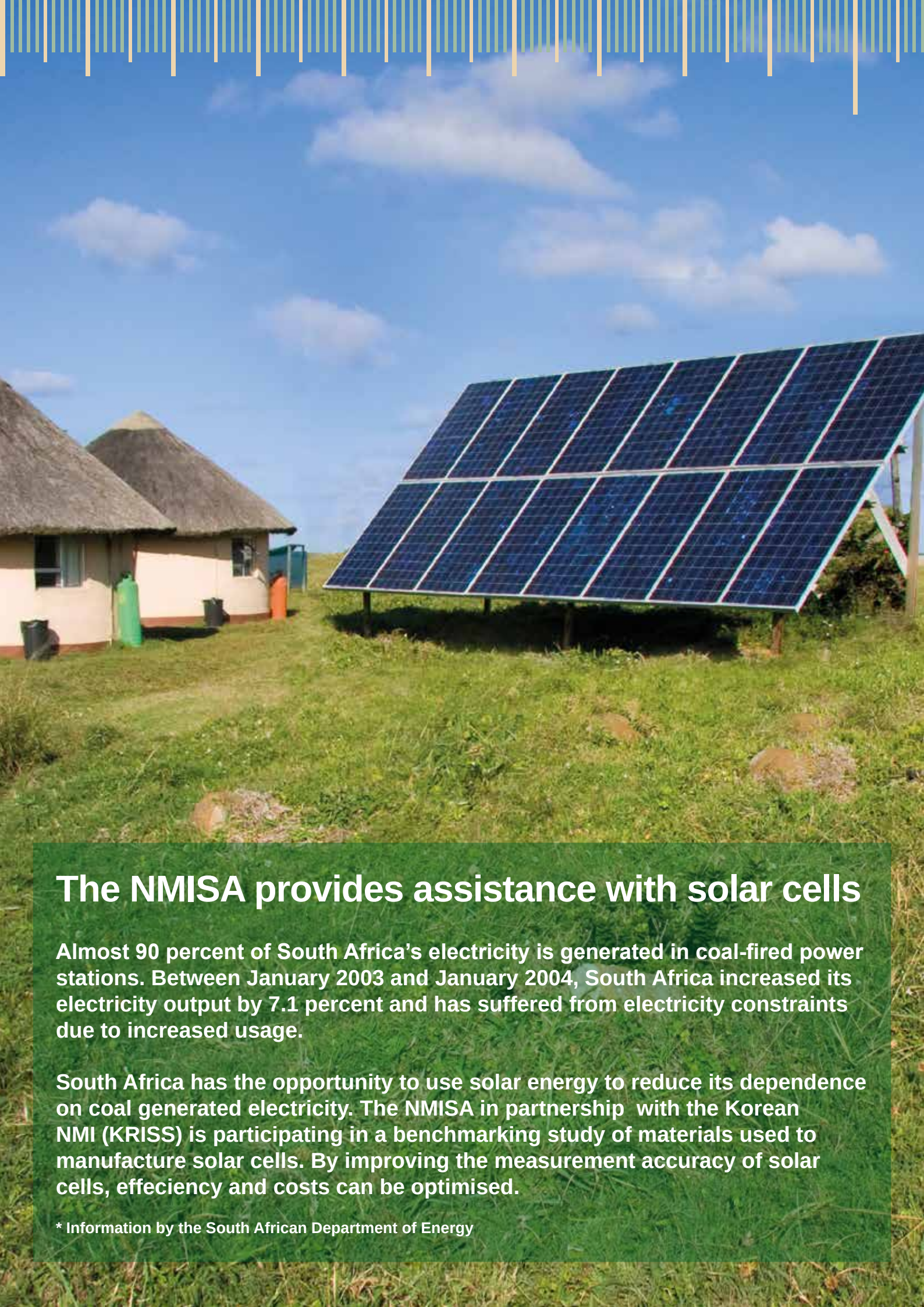
In preparing the annual financial statements, management is required to make estimates and assumptions that affect the amounts presented in the annual financial statements and related disclosures. Use of available information and the application of judgement are inherent in the formation of estimates. Actual results in the future could differ from these estimates, which may be material to the annual financial statements. Significant judgements include: provision for doubtful debts, useful life, residual value, impairment of assets and fair values.

Provision for doubtful debts

NMISA estimates the level of provision required for doubtful debts on an ongoing basis, based on historical experience, as well as other specific relevant factors. Refer to Note 5. A comparison between the provision and actual loss incurred is performed to assess the reasonableness of the provision methodology.

Useful lives and residual values of property, plant and equipment

Management made certain estimates with regard to the determination of estimated useful lives and residual values of items of property, plant and equipment, as discussed further in Note 2. An annual assessment and review of estimated useful lives and residual values performed through a review of technical reports, and any significant change is accounted for as a change in accounting estimate in accordance with GRAP 3.



The NMISA provides assistance with solar cells

Almost 90 percent of South Africa's electricity is generated in coal-fired power stations. Between January 2003 and January 2004, South Africa increased its electricity output by 7.1 percent and has suffered from electricity constraints due to increased usage.

South Africa has the opportunity to use solar energy to reduce its dependence on coal generated electricity. The NMISA in partnership with the Korean NMI (KRISS) is participating in a benchmarking study of materials used to manufacture solar cells. By improving the measurement accuracy of solar cells, effeciency and costs can be optimised.

*** Information by the South African Department of Energy**

Impairment

The recoverable service amount of non-cash generating assets and individual assets was determined, based on the higher of value in use and fair values of assets, less cost to sell. These calculations require the use of estimates and assumptions. It is reasonably possible that the value in use or fair value assumption may change, which may then impact on management's estimation and may then require a material adjustment to the carrying value of assets.

The entity reviews and tests the carrying value of assets when events or changes in circumstances suggest that the carrying amount may not be recoverable. If there are indications that impairment may have occurred, estimates are made for value in use.

The entity assesses its financial assets carried at amortised cost for impairment at each reporting date. In determining whether an impairment loss should be recorded in surplus or deficit, the entity makes judgements as to whether there is observable data indicating a measurable decrease in the estimated future cash flow from a financial asset.

Fair value

In determining fair value less cost to sell, management makes assumptions that are based on market conditions existing at the end of each reporting date, to determine a fair value of financial assets when there is observable evidence that the assets are impaired.

26. Irregular expenditure

Irregular expenditure, as defined in section 1 of the PFMA, is expenditure other than recognised expenditure, incurred in contravention of, or that is not in accordance with a requirement of any applicable legislation, including:

a) the PFMA; or

b) the State Tender Board Act, 1968 (Act No. 86 of 1968), or any regulations made in terms of this Act; or

c) any provincial legislation providing for procurement procedures in that provincial government.

Irregular expenditure is accounted for in terms of the National Treasury Practice Note No. 4 of 2008/2009, which was issued in terms of sections 76(1) to 76(4) of the PFMA.

Irregular expenditure that was incurred and identified during the financial year under review and which was condoned before year-end, must be disclosed appropriately in the irregular expenditure note. In such instances, no further action is required, with the exception of updating the note in the financial statements.

Irregular expenditure that was incurred and identified during the financial year under review and which was not condoned by the National Treasury or a relevant authority, must be recorded appropriately in the Irregular Expenditure Register. If the liability for irregular expenditure can be attributed to a person, a debt account must be created if such person is liable by law.

27. Fruitless and wasteful expenditure

Fruitless and wasteful expenditure refers to expenditure which is made in vain and would have been avoided had reasonable care been exercised.

Where an investigation determines, a receivable will be recorded against an employee who has been found to have incurred the fruitless and wasteful expenditure. In instances where a receivable is not raised against an employee or the amount is irrecoverable, the Accounting Authority may write off the debt.

Fruitless and wasteful expenditure identified is disclosed in the financial statements.

2. Receivables from exchange transactions

	2014 R	2013 R
Trade debtors	3 066 772	2 063 040
Other receivables – prepayments	648 607	216 854
Other receivables	75 135	-
Accrued interest income	-	181 384
Less: Provision for impairment of trade receivables (Note 2.1)	(213 755)	(277 307)
	3 576 759	**2 183 971**

NMISA does not hold any collateral as security.

The impairment of trade receivables was determined with reference to probability of collection of the amounts.

2.1 Movement in the provision for impairment of trade receivables

Opening balance	277 307	137 997
Utilised during the year	-	(137 997)
Movements during the year	(63 552)	277 307
Closing balance	**213 755**	**277 307**

3. Other receivables from non-exchange transactions

Other receivables	38 417	2 524
NRF receivable	-	20 000
	38 417	**22 524**

4. Cash and cash equivalents

Cash and cash equivalents consist of:		
Cash on hand	7 294	2 102
Bank balances	3 561 271	1 511 128
Short-term deposits*	91 484 983	37 734 206
	95 053 548	**39 247 436**

There are no restrictions on cash held with banks.

*Short-term deposit is the Money Market account held with Standard Bank.

5. Property, plant and equipment

	2014			Restated 2013		
	Cost R	Accumulated depreciation R	Carrying value R	Cost R	Accumulated depreciation R	Carrying value R
Furniture and Fittings	4 107 909	(1 893 813)	2 214 096	3 960 371	(1 509 752)	2 450 619
Office Equipment	3 646 410	(2 016 584)	1 629 826	3 270 140	(1 473 021)	1 797 119
Plant and Equipment	105 407 721	(33 283 172)	72 124 549	89 345 850	(25 176 579)	64 169 271
Motor Vehicles	54 251	(15 794)	38 457	62 865	(14 890)	47 975
Leasehold Improvements	1 856 365	(1 856 365)	-	1 792 365	(896 182)	896 183
	115 072 656	**(39 065 728)**	**76 006 928**	**98 431 591**	**(29 070 424)**	**69 361 167**

Reconciliation of property, plant and equipment: 31 March 2014

	Opening balance R	Additions R	Disposals R	Depreciation R	Impairment loss R	Total R
Furniture and Fittings	2 450 619	186 676	(17 545)	(405 654)	-	2 214 096
Office Equipment	1 797 118	496 584	(30 052)	(633 824)	-	1 629 826
Plant and Equipment	64 169 271	16 447 733	(237 704)	(8 254 751)	-	72 124 549
Motor Vehicles	47 976	-	(6 547)	(2 972)	-	38 457
Leasehold Improvements	896 183	64 000	-	(960 183)	-	-
	69 361 167	**17 194 993**	**(291 848)**	**(10 257 384)**	**-**	**76 006 928**

Reconciliation of property, plant and equipment: 31 March 2013

	Opening balance R	Additions R	Disposals R	Depreciation R	Impairment loss R	Total R
Furniture and Fittings	2 696 736	138 526	-	(384 643)	-	2 450 619
Office Equipment	1 667 700	615 555	-	(486 137)	-	1 797 118
Plant and Equipment	55 240 720	16 123 498	(296 680)	(6 898 267)	-	64 169 271
Motor Vehicles	50 954	-	-	(2 978)	-	47 976
Leasehold Improvements	1 792 365	-	-	(896 182)	-	896 183
	61 448 475	**16 877 579**	**(296 680)**	**(8 668 207)**	**-**	**69 361 167**

6. Intangible assets

	2014			2013		
	Cost R	Accumulated depreciation R	Carrying value R	Cost R	Accumulated depreciation R	Carrying value R
Software	1 173 995	(745 680)	428 315	1 093 845	(231 362)	862 483
	1 173 995	**(745 680)**	**428 315**	**1 093 845**	**(231 362)**	**862 483**

Reconciliation of intangible assets: 31 March 2014

	Opening balance R	Additions R	Disposals R	Depreciation R	Impairment loss R	Total R
Software	862 483	80 150	-	(514 318)	-	428 315
	862 483	**80 150**	**-**	**(514 318)**	**-**	**428 315**

Reconciliation of intangible assets: 31 March 2013

	Opening balance R	Additions R	Disposals R	Depreciation R	Impairment loss R	Total R
Software	102 118	945 008	-	(184 643)	-	862 483
	102 118	**945 008**	**-**	**(184 643)**	**-**	**862 483**

7. Payables from exchange transactions

	2014 R	Restated 2013 R
Trade payables	2 247 963	2 456 688
Other accrued expenses	4 248 022	1 330 063
	6 495 985	**3 786 751**

8. Other payables from non-exchange transactions

Income received in advance	128 324	109 917
Leave accrual (Note 8.1)	1 857 282	2 649 161
Other payables from non-exchange transactions	-	46 875
	1 985 606	**2 805 953**

8.1 Movement in the leave accrual

Opening balance	**2 649 161**	**2 609 257**
Movements during the year	**(791 879)**	**39 904**
Closing balance	**1 857 282**	**2 649 161**

9. Revenue

	2014 R	2013 R
Rendering of services	10 083 202	7 879 218
Non-exchange revenue	145 942 000	82 233 000
	156 025 202	**90 112 218**

The amount included in revenue arising from the exchange of goods or services is as follows:

Rendering of services	10 083 202	7 879 218

The amount included in revenue arising from non-exchange transactions is as follows:

Transfer received from controlling entity	145 942 000	82 233 000

10. Other income

Sundry income	318 328	248 109
Royalties income	33 648	26 254
Credit losses recovered	4 509	-
NRF revenue	-	119 650
	356 485	**394 013**

11. Employee-related costs

Basic earnings	32 116 372	34 488 042
Temporary employees	154 610	-
Performance bonuses	565 355	794 921
Third-party payments*	7 776 343	3 364 313
Unemployment Insurance Fund (UIF)	381 285	351 125
Leave expenses	(791 882)	39 907
Long service awards	6 355	7 400
Pay As You Earn (PAYE)	9 885 050	9 141 448
Compensation for Occupational Disease and Injuries	440 978	-
	50 534 466	**48 187 156**

* Payments include costs related to medical aid, pension fund contributions, group life, etc.

12. Operating expenses

	2014 R	2013 R
Auditor's remuneration	1 088 518	685 383
Bank charges	60 834	52 573
Bursaries	537 197	589 579
Carnet fees	8 084	-
Cleaning	-	547
Conferences and seminars	383 391	-
Consulting and professional fees	2 660 103	922 433
Chemical, gas and laboratory consumables	2 986 164	1 424 275
Electricity and rates	1 174 857	900 719
External calibration costs	863 061	1 331 542
Health and safety	331 855	424 050
Catering, events and meetings	157 937	-
Insurance	482 267	507 196
IT expenses	1 166 826	1 052 979
Lease rentals on operating lease	8 761 496	7 598 747
Library service and online license/books	8 254	164 363
Marketing and advertising	671 509	302 081
Motor vehicle expenses	77 072	66 959
Other expenses	-	2 106 477
Postage and courier	386 009	404 127
Printing and stationery	998 464	393 316
Promotions and sponsorships	18 640	41 659
Recruitment costs	541 968	31 396
Royalties and license fees	10 254	3 931
Retirement and resignation	3 500	-
SANAS Assessment/Quality expenses	480 728	568 902
Software expenses	601 466	66 989
Staff welfare	184 118	-
Subscriptions and membership fees	145 719	49 236
Subsistence and travel expense	482 960	-
Technical components	1 767 807	-
Telephone and fax	551 024	628 107
Training	922 029	692 061
Travel and catering for the Board	228 146	120 689
Travel – local	366 734	504 588
Travel – overseas	2 520 763	2 219 175
PTB expense	758 768	-
Patent and trademark renewals	59 035	-
PPP project expense	172 221	-
Whistle-blower	56 321	-
Year-end achiever awards	126 688	-
Board projects	137 950	-
Strategy (Board and CEO)	26 185	-
Books and reference material	182 079	-
	33 149 001	**23 854 079**

12. Operating expenses (continued)

	2014 R	2013 R

During the 2014 financial year, management changed the chart of accounts, which resulted in expenses being grouped in different classes of expenditure. As a result, the operating expenses between 2013 and 2014 are not entirely comparable.

13. Credit losses

Debts written off	**61 672**	**208 999**

14. Correction of error: Property, plant and equipment and Trade payables

During the financial year, management carried out asset verification as part of the year-end process and Asset Management Policy. This process identified assets that had been acquired in prior periods, but not included in the Assets Register. These assets had therefore not been included in the financial records. The omissions of assets in the financial records were subsequently corrected.

Effect of correction of error	2013 R	2012 R
Statement of Financial Position:		
Prior year (increase)/decrease in Accumulated surplus	(753 431)	(860 806)
Current year (increase)/decrease in Accumulated surplus	(264 144)	107 375
Total (increase)/decrease in Accumulated surplus	(1 017 575)	(753 431)
Increase/(decrease) in Property, plant and equipment	748 768	753 431
(Increase)/decrease in Trade payables	268 807	-
	-	-
Statement of Financial Performance:		
Increase/(decrease) in Depreciation expenses	109 561	107 375
Increase/(decrease) in Operating expenses	(373 705)	-
	(264 144)	**107 375**

Assets were included in the financial records and the Asset Register was updated accordingly at year-end. The assets are carried at cost, less accumulated depreciation. The above increase in 2013 in the property, plant and equipment line item, is cumulative from prior periods.

During the year, it was noted that transactions were recorded against accruals and trade payables. This resulted in a duplication of entries, which resulted in overstatement of expenditure and trade payables. The comparative amounts have been adjusted accordingly.

15. Cash generated from operations

	2014 R	2013 R
Surplus	61 537 499	8 375 246
Adjustments for:		
Depreciation and amortisation	10 771 702	8 852 850
Loss on assets written off	243 381	296 681
Leave expenses (included in employee-related costs)	(791 882)	-
Credit losses written off	61 672	208 999
Foreign exchange gain/(loss)	163 982	-
Changes in working capital:		
Increase in receivables from exchange transactions	(1 392 788)	(364 658)
Increase in consumer debtors	-	(209 008)
Increase in other receivables from non-exchange transactions	(15 893)	(14 976)
Increase in payables from exchange transactions	2 709 234	2 827 636
Increase/(decrease) in taxes and transfers payable (non-exchange)	(820 347)	42 049
Cash generated from operations	**72 466 560**	**20 014 819**

16. Commitments

Authorised capital expenditure		
Already contracted, but not provided for:		
Capital expenditure	10 746 769	7 859 456
Operating expenditure	8 554 633	4 360 631
	19 301 402	**12 220 087**
Not yet contracted for and authorised by member:		
Capital expenditure	**6 915 686**	**-**

This capital expenditure relates to purchases of property, plant and equipment.

Operating leases commitments – Building		
Due within one year	7 394 761	7 394 761
Due between two and five years	-	-

NMISA rents a building in terms of an operating lease for a period of three years, with a renewal option. The lease agreement for the building was entered into effective 1 April 2011 and is operational for a period of three years, expiring 31 March 2014. The CSIR allows for an escalation each year, based on CSIR annually approved rental rates. The operating lease converted to month-month on the date of expiry. The amounts disclosed are not contractual commitments. However, management disclosed an amount of R7 394 761 as it better presents the reality of future building lease payments for the anticipated lease renewal.

Operating leases commitments – Photocopiers		
Due within one year	328 738	89 809
Due between two and five years	238 929	89 809

NMISA signed contracts for the rental of photocopier machines with two service providers. The contracts are valid for 36 months and no annual escalation rate is applied as per the agreement.

17. Related parties

Controlling entity	Department of Trade and Industry
Members of key management	Mr Ndwakhulu Mukhufhi Mr Benjamin van der Merwe Ms Irene Mathatho Dr Wynand Louw Ms Zakithi Msimang Ms Natasha Nel-Sakharova Ms Jayne de Vos Mr Oelof Kruger (acting Director until 31 August 2013)
Entities under common control*	South African National Accreditation Systems (SANAS) Small Enterprise Development Agency (SEDA) The Companies Tribunal (CT) Export Credit Insurance Corporation (ECIC) National Empowerment Fund (NEF) South African Bureau of Standards (SABS) National Credit Regulator (NCR) National Gambling Board (NGB) National Consumer Commission (NCC) National Consumer Tribunal (NCT) National Lotteries Board (NLB) National Lotteries Trust Fund (NLTF) National Regulator for Compulsory Specifications (NRCS) Companies and Intellectual Property Commission (CIPC)

* The entities are under common control of the Department of Trade and Industry, of which NMISA forms part.

Key management information

Class	Description	Number of Members
Non-executive Board Members	Accounting Authority	10
Executive management	Accounting Authority	7

17. Related parties (continued)

Executive management emoluments 2014

	Basic salary R	Performance bonus R	13th cheque R	Pension contribution R	Allowances R	Other expenses R	Total R
Mr Ndwakhulu Mukhufhi (CEO – appointed 1 September 2013)	857 314	-	12 754	20 588	-	1 840	892 496
Mr Benjamin van der Merwe (acting CEO until 31 August 2013)	711 432	-	47 938	67 857	157 271	11 077	995 575
Ms Irene Mathatho	943 826	9 065	-	45 634	-	13 361	1 011 886
Dr Wynand Louw	975 820	18 983	-	80 524	103 860	90 399	1 269 587
Ms Zakithi Msimang	748 236	13 518	39 970	56 577	-	18 486	876 786
Ms Natasha Nel-Sakharova	793 761	13 446	-	62 355	-	4 677	874 239
Ms Betty-Jayne de Vos	734 882	13 396	47 573	68 549	-	8 622	873 022
Mr Oelof Kruger (acting Director until 31 August 2013)	240 488	-	27 676	16 717	22 853	1 847	309 581
	6 005 759	**68 408**	**175 911**	**418 801**	**283 984**	**150 309**	**7 103 172**

Executive management emoluments 2013

	Basic salary R	Performance bonus R	13th cheque R	Pension contribution R	Allowances R	Other expenses R	Total R
Dr Molefi Motuku (CEO – resigned May 2012)	176 174	-	21 199	13 044	60 000	126 346	396 763
Mr Benjamin van der Merwe (Acting CEO – appointed June 2012)	659 583	30 208	42 627	74 524	77 270	1 710	885 922
Mr Dakalo Netshivhazwaulu (CFO – resigned June 2012)	192 505	-	23 708	17 630	-	54 446	288 289
Ms Irene Mathatho (CFO – appointed September 2012)	518 455	-	-	25 720	-	729	544 904
Dr Wynand Louw	941 870	27 885	58 151	88 136	103 860	7 238	1 227 140
Ms Zakithi Msimang	693 724	16 277	35 541	66 459	-	1 541	813 542
Ms Natasha Nel-Sakharova	735 930	16 190	-	57 901	-	6 282	816 303
Ms Betty-Jayne de Vos	681 326	16 130	40 714	63 652	-	4 209	806 031
Mr Oelof Kruger (acting Director)	550 805	13 190	23 776	38 350	4 570	2 666	633 357
	5 150 372	**119 880**	**245 716**	**445 416**	**245 700**	**205 167**	**6 412 251**

17. Related parties (continued)

Non-executive management emoluments	Fees 2014 R	Fees 2013 R
Dr Prinsloo Nevhutalu	45 235	26 042
Mr Thembani Bukula	14 942	6 659
Mr Phil Hendricks (term ended March 2013)	-	24 204
Mr Tshokolo Nong	30 917	51 364
Ms Tshidi Molala	45 993	45 513
Dr Rudzani Nemutudi	43 201	40 521
Dr Notende Mgudlwa (term ended June 2013)	5 850	37 286
Adv Catherine Letele	17 538	15 362
Mr Kgosietsile Kgosiemang (appointed September 2013)	9 213	-
Ms Jabu Mogadime (appointed June 2013)	23 504	-
Ms Tumelo Seaketso (appointed June 2013)	25 655	-
Dr Cleopas Sanangura (appointed June 2013)	26 216	-
Dr Margrit Harting (term ended March 2013)	-	-
Dr Tshenge Demana (the dti representative)	-	-
	288 264	**246 952**

18. Irregular expenditure

	2014 R	2013 R
Opening balance	-	-
- Add: Irregular expenditure – current year	15 675	3 467 103
- Less: Amounts condoned	(15 675)	(3 467 103)
- Less: Amounts recoverable (not condoned)	-	-
- Less: Amounts not recoverable (not condoned)	-	-
	-	**-**

The above irregular expenditure is as a result of non-compliance with SCM processes and regulations. Deviation from normal procurement was not approved, which resulted in non-compliance with Supply Chain prescripts. The irregular expenditure was investigated, which resulted in the necessary action being taken to ensure that future occurrences are avoided. No further action against any individual was deemed necessary. The irregular expenditure was condoned by the Accounting Authority, after analysing the reasons for non-compliance.

19. Retirement benefits

Defined contribution plan	**3 360 219**	**3 364 312**

NMISA provides retirement benefits through a defined contribution plan to all its employees. The fund is governed by the Pension Funds Act, 1956 (Act No. 24 of 1956). The entity is under no obligation to cover any unfunded benefits.

20. Fruitless and wasteful expenditure

	2014 R	2013 R
Opening balance	86 938	-
Add: Fruitless and wasteful expenditure incurred during the year	-	177 232
Less: Recovered during the year	-	(90 294)
Less: Written off during the year	(86 938)	-
Closing balance	**-**	**86 938**

The fruitless and wasteful expenditure was incurred due to storage costs of items procured from a foreign supplier that were not cleared on time at the customs duty office. After internal investigation, NMISA was refunded a portion of R90 294, as it was discovered that the delay of collection was as a result of the courier company. The balance in the current year was approved for write-off after an internal investigation report was submitted and approved by the CEO.

21. Contingent liability

An application will be made to the National Treasury under section 53(3) of the PFMA to retain the surplus incurred in the current financial year ending 31 March 2014, totalling R61 537 499. Should permission to retain this surplus not be granted, then NMISA may be required to declare a distribution to the National Treasury through its Executive Authority, the dti.

NMISA considers the cash balance sufficient to pay over the surplus and funding will be replenished in the next year to fund the operations of the entity through the current budget allocation.

22. Financial risk management

NMISA's activities expose it to a variety of financial risks, namely market risk (including currency risk, interest rate risk and cash flow risk), credit risk and liquidity risk.

Liquidity risk

Prudent liquidity risk management implies maintaining sufficient cash. NMISA's primary source of funding is the grants received from the dti. NMISA maintains liquidity by limiting capital and operational expenditure within the pre-approved budget.

Cash flow risk

NMISA manages its cash flow risk by aligning the monthly allocation to its estimated monthly activity levels.

Non-exchange revenue – the dti allocation/transfer	**145 942 000**	**82 233 000**

22. Financial risk management (continued)

The table below illustrates NMISA's exposure to liquidity risk from financial liabilities:

2014	Carrying amount R	1 to 3 months R	6 to 9 months R	1 to 12 months R	2 to 5 years R	More than 5 years R
Trade and other payables	6 495 985	6 495 985	-	-	-	-
Total	**6 495 985**	**6 495 985**	**-**	**-**	**-**	**-**

2013	Carrying amount R	1 to 3 months R	6 to 9 months R	1 to 12 months R	2 to 5 years R	More than 5 years R
Trade and other payables	3 786 751	3 786 751	-	-	-	-
Total	**3 786 751**	**3 786 751**	**-**	**-**	**-**	**-**

Interest rate risk

NMISA's interest rate risk arises from markets and economic factors, payables, cash and cash equivalents and receivables. NMISA's exposure to interest rate risk is minimal due to the following factors:

- interest is levied on overdue trade receivables;.
- interest is not paid on trade payables as it is the policy of the entity to settle within 30 days of invoicing; and
- the PFMA does not allow for the entity to utilise bank overdraft facilities.

Based on the activities of NMISA, the only area affected by interest rate risk is investment income, earned on call deposits. These call deposits are held short-term and the interest rate is linked to the prime rate. The exposure to the changes in interest rate for a short-term deposit is not material.

NMISA's exposure to the risk of changes in market interest rates relates primarily to cash in notice deposits held with banks:

Cash and cash equivalents	2014 R	2013 R
Short-term deposits	**91 484 983**	**37 734 206**

Credit risk

Credit risk consists mainly of cash deposits, cash equivalents and trade debtors. NMISA only deposits cash with major banks with high-quality credit standing and limits exposure to any one counter-party.

Trade receivables comprise calibration of equipment undertaken by NMISA for private companies, based on requests from such companies. There is no independent rating; therefore management assesses the credit quality of the customer, taking into account its financial position, past experience and other factors. NMISA establishes an impairment that represents its estimate of potential losses in respect of trade receivables.

NMISA is considering all receivables between 90 and 120 days for the provision of bad debt and impairment. The provision for impairment is 7% of the total receivables book. The majority of the receivables are from the private sector. Based on this information, the credit quality of the receivables are medium.

22. Financial risk management (continued)

	2014 R	2013 R
The maximum exposure to credit risk for trade receivables by major customer cluster at the reporting date was as follows:		
Trade debtors	3 066 772	2 063 040
Other receivables	75 135	-
Accrued interest income	-	181 384
Less: Provision for impairment of trade receivables	(213 755)	(277 307)
Rental deposits	446 738	446 738
Total	**3 374 890**	**2 413 855**

As at 31 March 2014, the age analysis of the receivables from exchange transactions was as follows:

Not past due	1 232 797	1 126 403
Past due 1 – 30 days	1 380 741	438 845
Past due 31 – 60 days	174 583	161 706
Past due 61 – 90 days	62 056	111 364
Past due 90 days and over (impaired)	216 595	224 722
Past due – more than a year	-	-
Total	**3 066 772**	**2 063 040**

Currency risk

NMISA is exposed to this type of risk. NMISA's exposure to this risk is due to the purchase of specialised equipment from foreign suppliers. Due to the infrequent nature of these transactions, management does not employ any hedging mechanisms against this risk. To the extent that the transactions are considered to be material, significant suppliers are required to provide firm prices or a bank guarantee is utilised to minimise the risk.

23. Events after reporting date

The Accounting Authority is not aware of any matters that arose after the reporting date that requires adjustments to the financial statements or additional disclosure.

24. Going concern

The annual financial statements were prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realisation of assets and the settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

25. Budget compared to the Statement of Financial Performance

25.1. The increased allocation resulted in increased interest income. The National Treasury, through the dti, allocated R50 million for the recapitalisation of NMISA during the financial year. These cash resources increased the investment income.

25.2. Other income is not budgeted for as estimates are impractical to make.

25.3. The variance is as a result of the time-lag in the procurement of specialised scientific equipment, which forms part of NMISA's commitments at year-end. The procurement of the transactional advisor for the Recapitalisation Project was also not finalised by year-end.

25.4. Depreciation changed from the budgeted amount due to delays in acquiring some assets purchased from overseas suppliers.

25.5. Credit losses are not budgeted for as an estimate is impractical to make.

25.6. The budgets for repairs and maintenance are based on estimates that cannot be predicted with certainty. The NMS equipment are aging and the maintenance and repair expenses increased significantly as a result of break-downs and general maintenance.

25.7. During the year, contracts were reviewed, which resulted in some of the contracts being cancelled or amended, resulting in under-spending.

25.8. Loss on assets written off was not budgeted for as estimates are impractical to make.

25.9. The current financial year saw the majority of procurement done with overseas entities, resulting in increased foreign exchange losses.

NMISA did not exceed the budget in the financial year under review.

PART 5

HUMAN RESOURCES

5.1 HR Management Introduction

The implementation of the organisational structure progressed well, with key managerial positions and other critical positions filled. The successful appointment of the new CEO and the Compliance Manager were amongst other highlights, leaving only one top management position vacant. Retention of staff and, especially young black professionals, continued to be one of the major challenges facing the organisation. Major trends highlighted during exit interviews included career development opportunities and remuneration. A review of the strategies aimed at staff attraction and retention was conducted. Strategies implemented during the period under review and awaiting Board approval, include the following:

- **Salary benchmarking and job grading**

  The job grading and salary benchmarking process was conducted to ensure that salaries were competitive relative to the market, so as to assist the organisation with staff retention and the attraction of new talent. A report was compiled and submitted for consideration.

The Employee Recognition Policy was implemented. Some of the incentives offered included recognition of long service and enhancement of the annual achiever awards function, where the organisation formally gives recognition to its achievers.

5.2. Key Focal Areas for the Financial Year

5.2.1. Human Capital Development

Postgraduate and undergraduate bursaries

Four students, enrolled for the postgraduate bursary programme, are nearing completion of their studies. One of the four undergraduate bursars, Irma Kruger, completed her studies and was appointed fulltime. Two bursars terminated their contracts with NMISA – a loss that highlighted some areas in need of improvement for the organisation to ensure successful bursar commitment until completion of studies. Improvements made following feedback from the bursars, include enhancement of mentorship, regular feedback sessions and the monitoring of project plans via monthly and quarterly reports.

Internships and in-service training

Five interns received training and opportunities to work on projects aligned with their field of study. The internship caters for both technical and support functions. A number of students also received work exposure through the vacation work programme.

5.2.2. Improve Organisational Qualification Profile

NMISA once again set stretched targets to increase the number of PhD and MSc degrees in the organisation. The drive to improve the organisational qualification profile saw the appointment of three staff Members with MSc degrees and one staff member with a PhD degree in different technical areas, with an additional staff member with an MSc degree appointed in the CEO‘s office.

5.2.3. Transformation

Employment equity and skills development remained focal areas in working towards achievement of the organisation’s transformation goals. Although a target of 51% black professionals was met, employment equity remains a challenge, despite it having improved significantly from the previous period under review.

5.2.4. Management and Leadership Development

NMISA recognised that strong leadership is the cornerstone of success for any organisation. Training for, and development of the leadership team remained one of the focal areas, even though some of the planned training programmes were delayed – but will be priorities in the new financial year.

5.2.5. Employee Wellness Programme

A complete review of the Employee Wellness Programme (EWP) was done to reassess the benefits for staff, as well as for the organisation. The review necessitated a complete remake of the programme to reposition it as a strategic partner in ensuring employee wellbeing and overall health, with a positive impact on productivity and the quality of services offered by NMISA. The focus during the period under review was on the procurement of a new service provider for the EWP. The process was concluded towards the end of the period under review and the programme will be launched during the first quarter of the new financial year.

5.3. HR Oversight Statistics

Personnel costs for the organisation

Table 5.3.1: Personnel costs for NMISA

Division	Total expenditure for the entity (R'000)	Personnel expenditure (R'000)	Personnel expenditure (% of total expenditure) R'000	Number of employees	Average personnel cost per employee (R'000)
Chief Executive Officer	6 805	4 600	68%	7	657
Chemistry	14 384	9 146	64%	21	436
Electricity and Magnetism	12 266	10 079	82%	22	458
Finance and Corporate Services	40 715	8 519	21%	24	355
Ionising Radiation	4 976	4 604	93%	9	512
Physical Metrology	10 302	8 558	83%	18	475
Research and Technology Development	5 672	4 014	71%	8	502
Technical Infrastructure Development	3 294	917	28%	2	459
Total	**98 414**	**50 437**	**51%**	**111**	**454**

Personnel cost by salary band

Table 5.3.2: Personnel cost by salary band

Level	Personnel expenditure (R'000)	% of personnel expenditure to total personnel cost (R'000)	Number of employees	Average personnel cost per employee (R'000)
Executive management	7 874	16%	9	875
Middle-management	11 268	22%	16	704
Professionally qualified	25 996	52%	65	400
Skilled	4 593	9%	16	287
Semi-skilled	705	1%	5	141
TOTAL	**50 437**	**100%**	**111**	**454**

The difference in personnel cost is due to the exclusion of Board Members' emoluments, as well as contract employees and vacation students remuneration, leave provision, long service awards and COIDA expenses.

Performance rewards

Table 5.3.3: Performance rewards

Level	Performance rewards (R'000)	Personnel expenditure (R'000)	% of performance rewards to total personnel cost (R'000)
Executive Management	89	7 874	1%
Middle-Management	135	11 268	1%
Professionally qualified	516	25 996	2%
Skilled	25	4 593	0.5%
Semi-skilled	84	705	12%
TOTAL	**849**	**50 437**	**2%**

Training costs

Table 5.3.4: Training costs

Directorate/ Business Unit	Personnel expenditure (R'000)	Training expenditure (R'000)	Training expenditure as % of personnel costs	Number of employees	Average training cost per employee (R'000)
Chief Executive Officer	4 600	76	2%	7	11
Chemistry	9 146	110	1%	20	5
Electricity and Magnetism	10 079	90	1%	9	10
Finance and Corporate Services	8 519	302	4%	21	14
Ionising Radiation	4 604	8	0%	4	2
Physical Metrology	8 558	130	2%	16	8
Research and Technology Development	4 014	57	1%	5	11
Technical Infrastructure Development	917	27	3%	1	27
Total	**50 437**	**798***	**2%**	**83**	**10**

*The difference between the training expenditure of R798 000 and the R922 000 as reported in the annual financial statements, is due to R124 000 that was spent by the TID Division on training the SMMEs.

Employment and vacancies

Table 5.3.5: Employment vacancies summary

Level	Total number of approved posts	Funded vacancies 2013/14	% of funded vacancies	Unfunded vacancies 2013/14	% of unfunded vacancies
Executive Management	1	1	100%	0	0%
Middle-Management	11	4	36%	7	64%
Professionally qualified	35	10	29%	25	71%
Skilled	5	2	40%	3	60%
Semi-skilled	1	1	100%	0	0%
TOTAL	**53**	**18**	**34%**	**35**	**66%**

Table 5.3.6: Employment vacancies per division

Division	2012/13 No. of employees	2013/14 approved posts	2013/14 No. of employees	2013/14 vacancies	Funded vacancies	% of funded vacancies	Unfunded vacancies	% of unfunded vacancies
Chief Executive Officer	5	9	7	2	2	100%	0	0%
Chemistry	22	30	22	8	0	0%	8	100%
Electricity and Magnetism	21	26	22	4	4	100%	0	0%
Finance and Corporate Services	22	31	24	7	6	86%	1	14%
Ionising Radiation	9	12	9	3	1	33%	2	67%
Physical Metrology	18	30	18	12	3	25%	9	75%
Research and Technology Development	10	19	7	12	1	8%	11	92%
Technical Infrastructure Development	1	7	2	5	1	20%	4	80%
TOTAL	**108**	**164**	**111**	**53**	**18**	**34%**	**35**	**66%**

Employment changes

Table 5.3.7: Employment changes

Level	Employment at beginning of period	Appointments	Terminations	Promotions	Employment at end of period
Executive Management	7	2	0	0	9
Middle-Management	17	0	1	0	16
Professionally qualified	63	8	7	1	65
Skilled	16	5	4	-1	16
Semi-skilled	5	0	0	0	5
TOTAL	**108**	**15**	**12**	**0**	**111**

Reasons for staff leaving

Table 5.3.8: Reasons for staff leaving

Reason	Number	% of total number of staff leaving
Death	1	8.33%
Resignation	8	66.67%
Dismissal	0	0.00%
Retirement	3	25.00%
Ill health	0	0.00%
Expiry of contract	0	0.00%
Other	0	0.00%
TOTAL	**12**	**100.00%**

Although there was a slight improvement in terms of the staff turnover rate, strategies aimed at staff retention do require further attention and expansion.

Labour relations: Misconduct and disciplinary action

Table 5.3.9: Labour relations: Misconduct and disciplinary action

Levels	Nature of disciplinary action			
	Verbal warning	Written warning	Final written warning	Dismissal
Top Management	0	0	0	0
Senior Management	0	0	0	0
Professionally qualified	0	0	0	0
Skilled	2	0	0	0
Semi-skilled	0	0	0	0
Unskilled	0	0	0	0
TOTAL	**2**	**0**	**0**	**0**

Equity target and employment equity status

The NMISA's equity targets are listed on the next page. The projected headcount for the financial year under review came to 121 employees.

Employment equity

Total number of employees (including employees with disabilities) per occupational band.

Table 5.3.10: Employment equity

LEVELS: MALE	AFRICAN		COLOURED		INDIAN		WHITE		FOREIGN NATIONALS	
	Current	Target	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	2	3	0	0	0	1	2	2	0	0
Senior Management	0	0	0	0	0	0	0	0	0	0
Professionally qualified	19	20	2	1	1	2	21	23	3	0
Skilled	4	5	0	0	1	1	0	0	0	0
Semi-skilled	4	4	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0	0	0
TOTAL	**29**	**32**	**2**	**1**	**2**	**4**	**23**	**25**	**3**	**0**

Table 5.3.11: Employment equity

LEVELS: FEMALE	AFRICAN		COLOURED		INDIAN		WHITE		FOREIGN NATIONALS	
	Current	Target	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	2	2	0	0	0	0	2	2	0	0
Senior Management	0	0	0	0	0	0	0	0	0	0
Professionally qualified	13	15	1	1	0	0	18	21	1	0
Skilled	9	12	0	1	0	0	5	4	0	0
Semi-skilled	1	1	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0	0	0
TOTAL	**25**	**30**	**1**	**2**	**0**	**0**	**25**	**27**	**1**	**0**

Table 5.3.12: Employment equity (disabled staff)

LEVELS: DISABLED STAFF	MALE		FEMALE	
	Current	Target	Current	Target
Top Management	0	0	0	0
Senior Management	0	0	0	0
Professionally qualified	0	0	1	1
Skilled	0	0	0	0
Semi-skilled	0	0	0	0
Unskilled	0	0	0	0
TOTAL	**0**	**0**	**1**	**1**

Table 5.3.13: Equity as a 31 March 2014

Race	Equity as at 31 March 2014	Target for 2013/14
African	49%	51%
Coloured	3%	2%
Indian	2%	3%
White	43%	43%

The NMISA supports road safety in South Africa

Six out of 10 drivers who died in road accidents had dangerously high blood-alcohol levels, while one out of every seven motorists driving at night was drunk.

In early 2012, the Department of Transport proposed the lowering of the blood alcohol limit for drivers from 0.05 g/ 100 ml to 0.02 g/ 100 ml.

The NMISA developed the new 0.005 g/100 ml aqueous ethanol standard in Q4 of 2013/14, and should adequately address the proposed new regulation's reduced legal limit for driving under the influence of alcohol.

*** Information obtained from the Medical Research Council**

LIST OF ACRONYMS

AFRIMETS	Intra-Africa Metrology System
AFRA	African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology
AG	Auditor-General
AMI	Advanced Metals Initiative
APMP	Asian Pacific Metrology Programme
AQA	Air Quality Act, 2004 (Act No. 39 of 2004)
BD	Business Development
BIPM	International Bureau of Weights and Measures
BRICS	Brazil, Russia, India, China and South Africa
CC	Consultative Committee
CCAUV	Consultative Committee for Acoustics, Ultrasound and Vibration
CCG	Compliance and Corporate Governance
CCL	Consultative Committee for Length
CCQM	Consultative Committee for Amount of Substance: Metrology in Chemistry
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CGPM	General Conference on Weights and Measures
Ci	Curie
CIE	International Commission on Illumination
CIGS	Copper, Indium, Gallium and Selenium
CIPM	International Committee for Weights and Measures
CM	Chemistry
CMC	Calibration and Measurement Capabilities
CMM	Coordinate Measuring Machine
COIDA	Compensation for Occupational Injuries and Diseases Act, 1993 (Act No. 130 of 1993)
COTII	Committee of Trade and Industry Institutions
CRM	Certified Reference Material
Co	Cobalt
CT	Computed Tomography
3D	Three-dimensional
DDT	Dichlorodiphenyltrichloroethane
DEA	Department of Environmental Affairs
DEC	Developing Economies Committee
DoH	Department of Health
DS	Dosimetry Standards
the dti	Department of Trade and Industry
DWDM	Dense Wavelength Division Multiplexing
EDS	Energy Dispersive Spectroscope
EE	Employment Equity
EGM	Expert Group Meeting
EHS	Environment, Health and Safety
EM	Electricity and Magnetism
EMRP	European Metrology Research Programme
EPCRC	Environmental Pollution Compliance and Research Centre
ESS	Employee Self-Service
EWP	Employee Wellness Programme
EY	Ernst & Young (external audit firm)
EXCO	Executive Committee

FAPAS	Food Analysis Performance Assessment Scheme
FCS	Finance and Corporate Services
FCL	Forensic Laboratory
FERA	UK Food and Environmental Research Agency
GAW	Global Atmospheric Watch
GC-HRMS	Gas Chromatography coupled with High Resolution Mass Spectrometry
GC×GC	Two-dimensional Gas Chromatography
GDP	Gross Domestic Profit
GRAP	Generally Recognised Accounting Practice
HCD	Human Capital Development
HEI	Higher Education Institutions
HR	Human Resources
HSE	Health, Safety and the Environment
HVAC	Heating, Ventilation and Air-conditioning
IA	Internal Audit
IAEA	International Atomic Energy Agency
ICT	Information and Communication Technology
IEC	International Electro-technical Committee
IMU	Inertia Measuring Unit
INMETRO	Brazilian NMI
IPAP	Industrial Policy Action Plan
IPSAS	International Public Sector Accounting Standards
IR	Ionising Radiation
Ir	Iridium
IRSN	Institute for Radiological Protection and Nuclear Safety in France
ISCC	International Symposium on Capillary Chromatography
ISO	International Standards Organisation
ISO/REMCO	ISO Committee on Reference Materials
IT	Information Technology
JCRB	Joint Committee of Regional Metrology Organisations and the BIPM
KCDB	Key Comparison Database
KCWG	Key Comparisons Working Group
KPI	Key Performance Indicator
KRISS	Korean National Metrology Institute
KZN	KwaZulu-Natal
LCR	Least-cost Routing
LED	Light-emitting Diode
MEA	Multilateral Environmental Agreements
MOE	Ontario Ministry of the Environment, Canada
MoU	Memorandum of Understanding
MRA	Mutual Recognition Arrangement
MRI	Magnetic Resonance Imaging
MSc	Master of Science
MTEF	Medium-term Expenditure Framework
NCCM	National Committee on Chemicals Management
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NIP	National Industrial Participation
NLA	National Laboratory Association
NMI	National Metrology Institute
NMIE	National Metrology Institute of Ethiopia

NMISA	National Metrology Institute of South Africa
NMS	National Measurement Standard
NNR	National Nuclear Regulator
NOAA	National Oceanic and Atmospheric Administration
NPA	National Prosecuting Authority
NRCS	National Regulator for Compulsory Specifications
NRL	National Reference Laboratory
NRF	National Research Foundation
NSBC	National Small Business Chamber
OEM	Original Equipment Manufacturer
OHSAS	Occupational Health and Safety Advisory Services
OIML	International Organisation of Legal Metrology
PAHs	Polycyclic Aromatic Hydrocarbons
PAQI	Pan African Quality Infrastructure
PAYE	Pay As You Earn
PET	Positron Emission Tomography
PFMA	Public Finance Management Act, 1999 (Act No. 1 of 1999)
PhD	Doctor of Philosophy
PM	Physical Metrology
POPs	Persistent Organic Pollutants
PPP	Purchasing Power Parity
PPPFA	Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000)
PRGMs	Primary Reference Gas Mixtures
PT	Proficiency Testing
PTB	National Metrology Institute of Germany
PTS	Proficiency Testing Scheme
QS	Quality System
QCMs	Reference Materials for Quality Control
R&D	Research and Development
REC	Regional Economic Communities
RISDP	Regional Indicative Strategic Development Plan
RMO	Regional Metrology Organisation
RMOWG	Regional Metrology Organisations Working Group
RS	Radioactivity Standards
RTD	Research and Technology Development
SA	South Africa
SAAQIS	South African Air Quality Information System
SABS	South African Bureau of Standards
SADC	Southern African Development Community
SADCMET	SADC Cooperation in Measurement Traceability
SAMPS	South African Medical Physics Society
SANAS	South African National Accreditation System
SANS	South African National Standards
SCM	Supply Chain Management
SCOPA	Standing Committee on Public Accounts
SEM	Scanning Electron Microscope
SHEQ	Safety, Health, Environment and Quality
SI	International System of Units
SMME	Small, Micro and Medium Enterprise
SME	Small and Medium Enterprise
SPWG	Strategic Policy Working Group
SQAM	Standards, Quality Assurance, Accreditation and Metrology

STA	Stack Testers Association
STC	SANAS' Ambient Air Specialist Technical Committee
TAF	Technical Advisory Forum
TBT	Technical Barrier to Trade
TC	Technical Committee
TCDR	Triple to Double Coincidence Ratio Measurement
TEI	Tertiary Education Institute
The Measurement Act	Measurement Units and Measurement Standards Act, 2006 (Act No. 18 of 2006)
TID	Technology Infrastructure Development
TOFMS	Time-of-Flight Mass Spectrometry
TQMS	Total Quality Management System
UCT	University of Cape Town
UIF	Unemployment Insurance Fund
UNIDO	United Nations International Development Organisation
VAMAS	Versailles Project on Advanced Materials and Standards
WG	Working Group
WHO	World Health Organization
WMO	World Meteorological Organization
XPS	X-ray Photoelectron Spectroscope

NOTES

NOTES

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