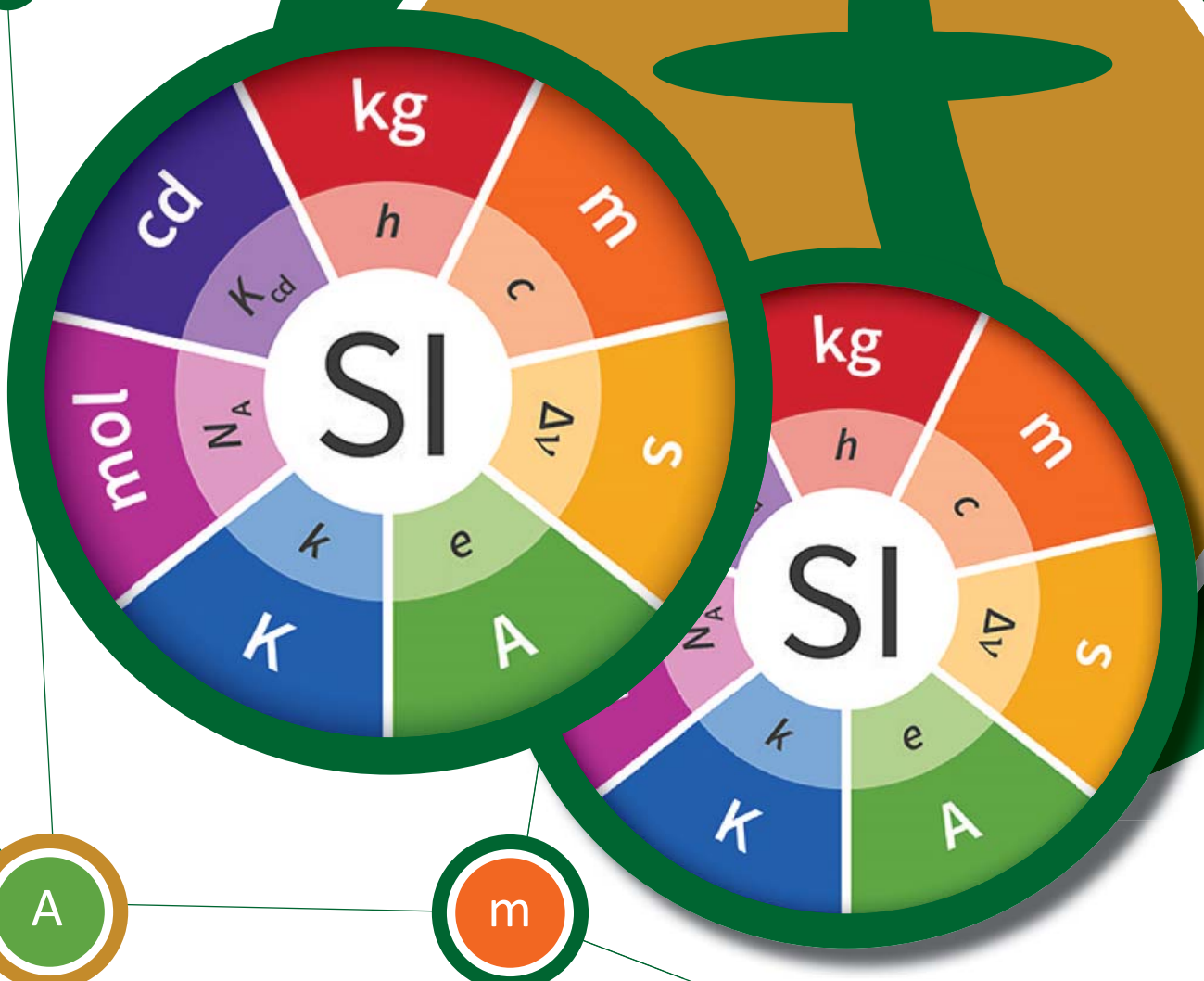

nmisa

National Metrology Institute of South Africa

ANNUAL REPORT

2018/19

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PART A:

GENERAL INFORMATION

A.1 Corporate Information

NAME	National Metrology Institute of South Africa (NMISA)
PHYSICAL ADDRESS	Meiring Naude 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	NEXIA SAB&T Pretoria
BANKERS	Standard Bank Lynnwood Ridge Pretoria
COMPANY/ BOARD SECRETARY	Adams and Adams

A.2 Abbreviations / 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
AGRILASA	Agricultural Laboratory Association of South Africa (AGRILASA)
AMI	Advanced Metals Initiative
AMS	Advanced Measurement Solutions
AOAC	Association of Official Analytical Communities
APMP	Asian Pacific Metrology Programme
ARAC	Arab Accreditation Cooperation
ARSO	African Organisation for Standardisation
AUC	African Union Commission
AYOQ	African Year of Quality
BD	Business Development
BIPM	International Bureau of Weights and Measures
BRIC	Brazil, Russia, India and China
CC	Consultative Committee
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CFTA	Continental Free Trade Area
CGCSA	Consumer Goods Council of South Africa
CGPM	General Conference on Weights and Measures
CGS	Council for Geosciences
CIE	International Commission on Illumination
CIGRÉ	The International Council on Large Electric Systems
CIPM	International Committee for Weights and Measures
CMC	Calibration and Measurement Capabilities
COTII	Committee of Trade and Industry Institutions
CRM	Certified Reference Material
CSIR	Council for Scientific and Industrial Research
DAFF	Department of Agriculture, Forestry and Fisheries
DDT	Dichlorodiphenyltrichloroethane
DoH	Department of Health
DTI	Department of Trade and Industry

EBSD	Electron Backscatter Diffraction
EDS	Energy Dispersive Spectroscopy
EE	Employment Equity
EE	Energy Efficiency programme
EGM	Expert Group Meeting
EHS	Environment, Health and Safety
EMS	Environmental Management System
EPCRC	Environmental Pollution Compliance and Research Centre
ESKOM	Electricity Supply Commission
EURAMET	European Association of National Metrology Institutes
EXCO	Executive Committee
FAMES	Fatty Acid Methyl Esters
FTA	Free Trade Agreements
GDP	Gross Domestic Profit
GE	Green Economy programme
GNSS	Global Navigation Satellite System
GRAP	Generally Recognised Accounting Practice
HCD	Human Capital Development
HEI	Higher Education Institutions
HSE	Health, Safety and the Environment
HVAC	Heating, Ventilation and Air conditioning
IAEA	International Atomic Energy Agency
ICT	Information and Communication Technology
IEC	International Electro-technical Committee
ILAC	International Laboratory Accreditation Cooperation
IPAP	Industrial Policy Action Plan
IPSAS	International Public Sector Accounting Standards
IPK	International Prototype of the Kilogram
IR	Ionising Radiation
ISO	International Standards Organisation
iMAT	Materials Characterisation and Inorganic section
IT	Information Technology
JCRB	Joint Committee of Regional Metrology Organisations and the BIPM
KCDB	Key Comparison Database

A.2 Abbreviations / Acronyms
(continued)

KPI	Key Performance Indicator
KZN	KwaZulu Natal
LED	Light-emitting Diode
LNE	Laboratoire National de Métrologie et d'essais
MC	Manufacturing Competitiveness
MEA	Multilateral Environment Agreements
MOU	Memorandum of Understanding
MP	Member of Parliament
MRA	Mutual Recognition Arrangement
MRL	Maximum Residue Limits
MSc	Master's Degree in Science
MTEF	Medium-term Expenditure Framework
NA	Avogadro Number
NCC	National Consumer Commission
NCCM	National Committee on Chemicals Management
NDP	National Development Plan
NEDLAC	National Economic Development and Labour Council
NIM	National Institute of Metrology, China
NIST	National Institute of Science and Technology of the USA
NMI	National Metrology Institute
NMISA	National Metrology Institute of South Africa
NMS	National Measurement Standards
NNR	National Nuclear Regulator
NPA	National Prosecuting Authority
NPL	National Physics Laboratory of the United Kingdom
NRCS	National Regulator for Compulsory Specifications
NRL	National Reference Laboratory
NRF	National Research Foundation
NSBC	National Small Business Chamber
NSI	National System of Innovation
OEM	Original Equipment Manufacturer
OH&S	Occupational Health and Safety
OHSAS	Occupational Health and Safety Assessment Series
OIML	International Organisation of Legal Metrology

PAQI	Pan-African Quality Infrastructure
PFMA	Public Finance Management Act
PhD	Doctor of Philosophy
POPs	Persistent Organic Pollutants
PPECB	Perishable Products Export Control Board
PPP	Purchasing Power Parity
PRGMs	Primary Reference Gas Mixtures
PTB	National Metrology Institute of Germany
PTS	Proficiency Testing Schemes
QoL	Quality of Life
QS	Quality System
RAM	Resonant Acoustic Mixer
REC	Regional Economic Communities
RI	Regional Integration
RM	Reference Material
RMO	Regional Metrology Organisation
RPPs	Renewable Power Plants
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
SAGL	South African Grain Laboratory
SANAS	South African National Accreditation System
SANEDI	South African National Energy Development Institute
SANS	South African National Standards
SARAO	The South African Radio Astronomy Observatory
SCM	Supply Chain Management
SCOPA	Standing Committee of Public Accounts
SEM	Scanning Electron Microscope
SHEQ	Safety, Health, Environment and Quality
Si	Silicon
SI	International System of Units
SIM	Inter-American Metrology System

A.2 Abbreviations / Acronyms
(continued)

SMME	Small, Micro and Medium Enterprise
SME	Small and Medium Enterprise
SQAM	Standards, Quality Assurance, Accreditation and Metrology
TAF	Technical Advisory Forum
TBTs	Technical Barriers to Trade
TC	Technical Committee
TEI	Tertiary Education Institute
TI	Technical Infrastructure
The Act	Measurement Units and Measurement Standards Act, No. 18 of 2006
TOFSIMS	Time-of-flight Secondary Ion Mass Spectrometry
UNIDO	United Nations Development Organisation
UTC	Coordinated Universal Time
UWC	University of the Western Cape
WG	Working Group
XPS	X-ray Photoelectron Spectroscopy

A.3 Foreword by the Minister

It is my pleasure to present the Annual Report of the National Metrology Institute of South Africa (NMISA) for the 2018/19 financial year.

The results contained in this report coincide with the beginning of the 6th administration of the democratic South Africa.

The focus of the new administration is to boost economic growth and enable deeper levels of economic inclusion and transformation.

A new Department of Trade, Industry and Competition has been established, through a merger of **the dti** and Economic Development Department, which will drive the implementation of a more focused, high-impact industrial strategy.

Over the next five years, the focus will be on practical actions and improved governance, to pull our economy onto the higher growth levels we require to create decent work and entrepreneurial opportunities for many more South Africans, particularly young people. There are no quick fixes if we want to build this high-growth, high-employment, high-inclusion economy.

Using the resources and mandate of the trade, industry and competition portfolio, we will support efforts to unleash private investment and energise the state to boost economic growth and inclusion. This is an essential part of building confidence and the platform for job-creation.

The NMISA will have a role to play in this new industrial strategy, in developing, keeping and maintaining the world class national measurement standards for industry.

As priorities for the new Administration we have outlined six focus areas in the trade, industry and competition portfolio, within which the NMISA falls:

First, to support improved industrial performance, dynamism and competitiveness of local companies

These include developing Master Plans in priority sectors to help create conducive conditions for industries to grow, improve their industrial capacities and sophistication, focus more on export orientation and reclaim domestic market space lost to imports.

The Master Plans will be action-oriented, developed and carried out in partnership with business and labour and implemented in stages, so that we can move expeditiously.

Second, to improve the levels of fixed investment in the economy

Over the five-year period from 2018/19, Government set a target of R1.4 trillion in new investment in the economy. The vast bulk of this must come from the private sector.

The State's role will be to enable higher levels of fixed investment (both domestic and foreign), through addressing infrastructure and skills gaps, and by partnering with the private sector through a range of incentives and financial packages.

Appropriate National Measurement Standards will help to attract greater levels of investment.

Third, to expand markets for our products and facilitate entry to those markets.

The single biggest initiative is the African Continental Free Trade Area (AfCFTA) which will connect 1.2 billion people into a single bloc where local products will be traded between countries, with minimal tariffs. These agreements lay the basis for increased intra-African trade and can cement the continent's position as the next growth frontier.

The implementation phase was launched on 7 July 2019, at a Special African Union Summit meeting in Niger, with the intention to come into effect on 1 July 2020.

The Agreement will fundamentally change and reshape the South African economy. Already, exports to other African countries support about 250 000 South African jobs and it is the fastest-growing market for our manufactured exports.

Fourth, to promote economic inclusion

This means opening up and changing our market structure, to bring more young people, women and Black Industrialists into the economy.

To enhance the growth of Black industrialists, we will combine the efforts of the Department and its agencies into a seamless and coordinated programme. Over the next 5 years, we will support an additional 400 Black Industrialists' projects with financial support of R40 billion, through identifying sustainable businesses and promoting both industrialists, new enterprise formation and worker involvement in the enterprises, using a combination of private and public sector resources.

Fifth, to promote more equitable spatial and industrial development

A pillar of our industrial policy is to develop new investment clusters through special economic zones, revitalisation of industrial sites and support for business and digital hubs.

Sixth, to improve the capability of the State

This means being more responsive to the needs of South Africa's entrepreneurs, moving faster in making decisions and carrying out functions, coordinating better between departments and agencies and creating a business-encouraging environment in which more investment and more job creation can take place.

Part of a smart State is partnering with domestic businesses to invest more in innovation and R&D, as new techniques, new products and new distribution platforms can move South Africa up the value-chain and enhance job creation.

All public entities, including NMISA will have to work with a greater sense of urgency to support government in achieving its ambitions for the new administration. This is what has been called the spirit of khawuleza, and it must define our approach both within Government and public entities to addressing the structures in the economy which impede growth, economic inclusion and job creation.

I would like to appreciate the work of the NMISA Board of Directors and Executive Management to enable the entity deliver on its mandate and wish them success in the year ahead to help build an economy that creates more jobs and grows faster and more inclusively.

Mr Ebrahim Patel
Minister of Trade and Industry

A.4 Foreword by the Chairperson

NMISA was established to be the link to the international measurement system for South Africa. This link is especially important in the current context of the fourth industrial revolution and the expansion of trade for South Africa including the recent launch of the operational phase of the Continental Free Trade Area (AfCFTA).

The trade of goods and services around the world is the lifeblood of the global economy, and is increasingly important for domestic economic growth, productivity and investment opportunities. For customers to consider trade to be fair and benefit from it, measurements taken in different parts of the world needs to be equivalent to each other and accepted by each other. This is especially important because decisions, be they business, economic, social and medical are based on measurement results.

The process of measurement is of considerable importance in almost every field of human activity, and it has been estimated that in industrialised countries measurement and related operations account for 4 % to 6 % of the Gross National Product. To be meaningful, measurements must be underpinned by metrology, the science of measurement.

Measurement is also important to the innovator as it offers an objective way to demonstrate to customers that an innovative product is indeed superior to the competition. In the absence of any such measurements, the sceptical customer may be unconvinced, but if the superior product characteristics can be measured in an objective (and independently verifiable) way, then this supports the marketing effort of the innovative producer. In this way, measurement can play an important role in avoiding market failure for innovative new products.

It gives me great pleasure to present the NMISA Annual Report for the financial year 2018/19. Once more the entity has demonstrated its commitment to good governance by attaining a clean audit opinion from the external auditors. This was achieved while maintaining the high level of performance that has become the entity. Fourteen of the 15 planned KPI targets were met or exceeded while achieving 71.4 % of the 15th target to yield an effective overall performance of 98%. This was achieved while the entity continues to maintain the total quality management system and accreditation to ISO 17025 for the laboratories, ISO guide 34 for reference material production laboratories as well as maintenance of certification to ISO 14001 and OHSAS 18001 for environmental, health and safety. To ensure support for the AfCFTA, the entity expanded its accreditation to include ISO 17043 for development and operation of proficiency testing schemes.

Our achievements are as a result of the hard work, dedication and commitment to team work by all our staff. On behalf of the NMISA Board of Directors, I would like to thank the CEO and his team of NMISiAns for their contribution to our success. The aggressive human capital development (HCD) programme implemented over the past five years has developed for us the skills required to implement our programs as we respond to the increasing demand of accurate measurement for our economy. With the upgraded equipment and our human capital, I have confidence that NMISA will be able to deliver to the refocussed strategy and mandate as outlined in the strategic plan 2019/2024.

The equipment portion of the NMISA recapitalisation project is already yielding positive results with the improvement in national measurement standards and establishment of state of state-of-the-art programs such as the reference

material production facility. However, the aged laboratory infrastructure leased from the CSIR still remains the biggest challenge for the entity. It is the board's hope that funding will be made available during the MTEF for the building of new NMISA laboratory infrastructure.

I would like to thank all the stakeholders and **the dti** in particular for their confidence in NMISA and continued financial support. I would also like to thank all our partners and collaborators both locally and Internationally.

Ms Jabu Mogadime
Chairperson
NMISA
31 July 2019

A.5 CEO's Overview

On 16 November 2018, the General Conference on Weights and Measures (CGPM) agreed perhaps one of the most significant revisions to the International System of Units (the SI) since its inception in 1960. The CGPM resolved to base the SI on our best understanding of the laws of nature and to eliminate the link between the SI and definitions based on physical artefacts. The change was underpinned by research into new measurement methods, including those using quantum phenomena as the basis for standards that are fundamental. Throughout history every leap in economic development that can be called an industrial revolution either necessitated or was accompanied and/or enabled by an improvement in the measurement system of the time. After the formalisation of the international measurement system through the signing of the metre convention in 1875, these improvements in measurement systems were clearly recorded. The first industrial revolution, which was characterised by the development of mechanical production using steam power, was accompanied by the development of the temperature measurement system using the Celsius scale. The formalisation of the International System of Units (SI) by the 11th CGPM in 1960 following the introduction of the ampere, the kelvin and the candela as base Units, respectively, for electric current, thermodynamic temperature and luminous intensity in 1954 (10th CGPM) happened at the heart of the 2nd industrial revolution. This was necessary because the 2nd Industrial revolution was characterised by the development of the assembly line, the use of electrical power and the measurement system had to be adequate to support these. The current version of the SI was completed in 1971 by adding the mole for amount of substance to bring the total number of base units to seven. During the 3rd industrial revolution in the 1970s and 1980s, we saw the introduction of computer aided production and the use of electronics and automation of the manufacturing process. These developments were accompanied or perhaps ushered in by the revisions of the SI base units for length, the metre, and linking it to the SI base unit for time, the second.

It is clear then that great revolutions are accompanied by revolutions in the measurement system. It follows therefore that the current great revolution, the fourth industrial revolution (4 IR or Industry 4.0) requires an improvement in the SI. The revision of the SI which became effective on World Metrology Day, 20 May 2019, is very critical because metrology, the science of measurement, plays a central role in scientific discovery and innovation, industrial manufacturing and international trade, in improving the quality of life and in protecting the global environment.

NMISA was established under the Measurement Units and Measurement Standards Act, No. 18 of 2006 (The Measurement Act) as the custodian of the National Measurement Units and National Measurement Standards (NMS). In this role, as part of the South African Technical (Quality) Infrastructure, NMISA maintains and ensures the appropriate application of the International System of Units (SI) and other measurement units as defined by NMISA in consultation with the measurement community, for the country. In the context of a fast-changing environment in the fourth industrial revolution and the accompanying revision of the SI, NMISA adopted a strategic plan under the theme of "Shortening the traceability chain for Africa". This was important to ensure that South Africa's economy is protected against potential barriers to trade that may arise from the lengthening of the traceability chain resulting from only having secondary standards that would have to be calibrated in first world countries with primary standards. NMISA therefore implemented programs that responded to the increased demand presented by the need for accurate measurement increasingly closer to the end user such as regulators and manufacturers.

NMISA also played a leading role that is central to the development of a sound metrology infrastructure in Africa, especially in support of South Africa's immediate neighbours in the Southern African Development Community (SADC). This role is becoming even more

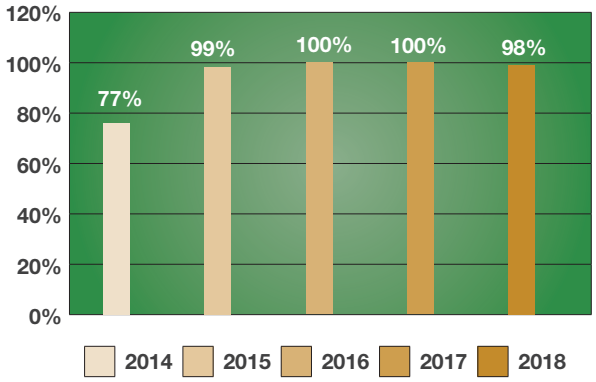
important with the advent of the Africa Continental Free Trade Area (AfCFTA) and the precursor Tripartite Free Trade Area (TFTA) as standardisation, metrology, conformity assessment and accreditation are the key components in the implementation of free trade agreements between countries/economic trade blocks. In this context, accurate measurement is paramount for fair trade, competitive manufacturing, efficient health care, effective environmental monitoring and law enforcement. The expanding trade and pressure to eliminate technical barriers to trade (TBTs) creates a constant demand for greater accountability and demonstrated competence to the National Measurement Institutes (NMIs).

The year under review also marks the end of my first five-year term as CEO. During the term, the organisation was successfully refocussed to provide fit for purpose measurement solutions to industry and in support of government regulation. The organisation's operations were structured in a matrix format with thematic programmes that are focussed on delivering solutions to clients sourcing capabilities and skills from technical divisions in cross-cutting projects that effectively eliminated the silo approach that was part of the organisation's culture.

The National Metrology Institute of South Africa presents its annual report for the 2018/19 financial year. In the year under review, the entity achieved 14 of its 15 KPI targets while maintaining an unqualified audit opinion with no matters of emphasis which the organisation has attained for the fifth successive year. Under the theme of shortening the traceability chain for South Africa and underpinned by regional integration supported by a commercial services unit for enhanced client service, the organisation has been structured into the following programmes:

- Advanced Measurement Solutions
- Energy Efficiency
- Green Economies
- Manufacturing competitiveness
- Quality of life
- Reference Material
- Redefinition of the SI

With the refocusing on the client, the organisation has managed to maintain a high level of performance against its targets over the past few years while achieving unqualified audit opinions from external auditors. The performance of the organisation over the Medium-Term Expenditure framework is summarised in the graph below:



The highlights in the achievements of the organisation includes that enhancements to the provision of measurement solutions to enhance regulation by regulators and Government departments.

The entity's support was underpinned by an aggressive Human capital development programme that developed skills that assisted in the transformation of the equity profile of the organisation while increasing the overall organisational capability. Over the past five years, a total of thirty-seven (37) students (17 Undergraduate, 14 Masters, 6 PhD) were supported through the NMISA Bursary scheme. To date 17 students have completed their studies. Upon completion of their studies, the graduates are given work back contracts for the duration equivalent to their bursary terms. Upon completion of the work-back contracts, the graduates are considered for full time employment. Eight of the graduates were absorbed into permanent positions in various metrology divisions while the remining graduates are busy with their work back. Fifteen students are currently enrolled.

Furthermore, the bursary programme also focused on the improvement of the qualification profile of the organisation. To date 37 permanent employees have been supported through the NMISA bursary scheme in line with their personal development plans. The financial, academic and research support staff enabled them to undertake studies as follows:

- Undergraduate: 12
- Masters: 12
- Doctorate: 13

The developed skills are ready to contribute towards the implementation of the refocussed strategy as outlined in the NMISA Strategic Plan 2019/2024.

In response to the challenge of aged infrastructure and equipment, NMISA requested funding from **the dti** for new laboratory infrastructure and equipment recapitalisation. A decision was taken to implement the NMISA recapitalisation project in 2 parallel phases. The one project was dealing with equipment upgrade and recapitalisation while the other project focussed on the development of new laboratory accommodation. As part of the NMISA laboratory accommodation recapitalisation project, a PPP project was registered with National Treasury in line with Treasury Regulation 16. Guided by the National Treasury's PPP Unit, a feasibility study was conducted which confirmed that NMISA does indeed require modern laboratory facilities as the current accommodation environment is no longer able to maintain the required measurements at the high accuracy required for a national facility. However, citing affordability, National Treasury did not grant TA I approval. The aged laboratory infrastructure remains the top challenge that NMISA faces.

The parallel project for equipment recapitalisation was implemented successfully with NMISA currently boasting modern equipment that allows the entity to provide the national measurement standards and fit for purpose measurement solutions to the economy. The adequacy of the environment where the recapitalised equipment is operated remains a challenge though.

The amount spent on equipment recapitalisation since 2014/15 are presented in the table below.

Year	Budget spent
2014/15	R135 928 000
2015/16	R156 498 000
2016/17	R126 552 000
2017/18	R111 911 000
2018/19	R87 588 000
Total	**R618 477 000**

Looking forward, the NMISA Strategic plan for 2020 to 2024 will build on the successes of the past five years and expand the traditional offerings of the application of measurement units and the establishment of measurement standards to a comprehensive measurement offering to government, state owned enterprises and applied/industrial metrology. Thus, NMISA will focus on the following:

- Providing metrology for regulatory purposes and in support of Government laboratories for compliance, development and implementation of regulations.
- Consolidation of metrology services performed by SOEs under NMISA to provide efficient shared services to better support the South African Government and industry.
- Fit for purpose metrology for industry including assistance to SMEs to provide appropriate services in support of manufacturing, beneficiation and export.
- Location of Legal metrology under NMISA, and strategic alignment with Legal metrology to effectively implement the Legal Metrology Act.

The strategic plan will be implemented in the context of the fourth industrial revolution and government's initiatives and plans to expand trade. The entity will implement projects to realise three of the four SI base units revised. The entity will also establish a Regional Reference Institute for quality assurance and reference measurements in support of regulations and the Africa Continental Free Trade Area (AfCFTA).

I would like to take this opportunity to thank all NMISiAns for their continue commitment to excellence and embracing our moto of "flying with our strength while we let others to compliment us on our weaknesses. I would also like give appreciation to the NMISA board of directors whose term ended in June 2018 and the new board of director that took over in July 2018.

I am looking forward to the next five years of NMISA excellence in measurement.

Mr Ndwakhulu Mukhufhi
Chief Executive Officer
NMISA
31 July 2019

A.6 Statement of Responsibility and Accuracy

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 NMISA, submit the performance and progress of the entity for the financial year 2018-2019 in terms of the Public Finance Management Act No. 1 of 1999.

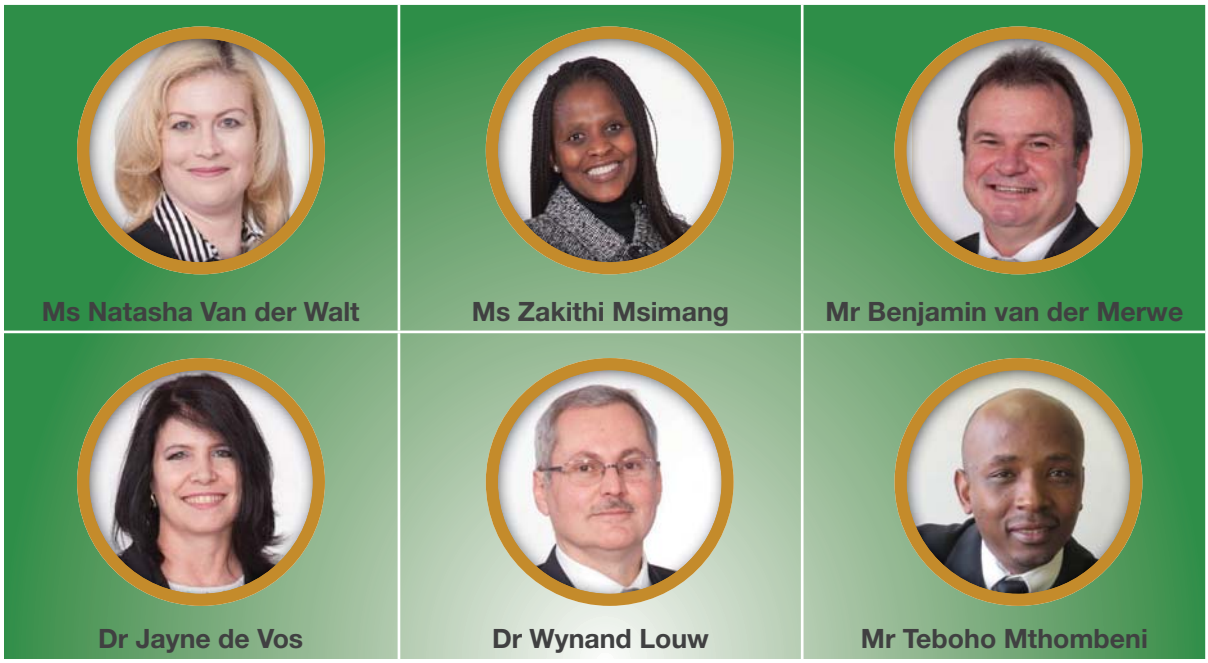
Ms Jabu Mogadime
31 July 2019

A.7 Submission to the Executive Authority

It is hereby certified that this Annual Report:

Was prepared by the Management of NMISA under the guidance of the Board and the Board Chair, Ms Jabu Mogadime and Accurately reflects the performance outputs that NMISA has achieved given the resources made available in the budget for 2018-2019.

Prepared and compiled by NMISA Directors



Mr Calvin Sehlapelo CA (SA)

Chief Financial Officer

Mr Ndwakhulu Mukhufhi

Chief Executive Officer

Ms Jabu Mogadime

Board Chairperson

Mr Ibrahim Patel

Executive Authority

A.8 NMISA Board Members and Executive

A.8.1 Board of Directors

Mr Ndwakhulu Mukhufhi
CEO

Ms Jabu Mogadime

Ms Ursula Ntsubane

Mr Petrus Mohlomi

Dr Tshenge Demana

Mr Odirile Dingoko

Ms Bavelile Hlongwa

Ms Nobom Mfabana

Ms Lindie Lankalebalelo

A.8 NMISA Board Members and Executive

A.8.2 Executive Management

Mr Benjamin van der Merwe

Dr Wynand Louw

Ms Zakithi Msimang

Ms Natasha van der Walt

Mr Teboho Mthombeni

Mr Calvin Sehlapelo

Dr Jayne de Vos

A.9 Strategic Overview

A.9.1 Vision, Mission and Values

A.10 Legislative And Other Mandates

The National Metrology Institute of South Africa (NMISA) was established under the Measurement Units and Measurement Standards Act, No18 of 2006 (The Measurement Act).

> *To provide for the use of measurement units of the International System of Units (SI) and certain 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).*

South Africa is a signatory to the Metre Convention, a treaty dating back to 1875. Under this Convention the International Bureau of Weights and Measures (BIPM) was created to act in matters of world metrology, particularly concerning the demand for measurement standards of ever increasing accuracy, range and diversity, as well as to address the need to demonstrate equivalence between NMS. The International System of Units (SI) was also established under 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 a response to a growing need for an open, transparent and comprehensive scheme to give users reliable quantitative information on the comparability of National Metrology services and to provide the technical basis for wider agreements negotiated for International trade, commerce and regulatory affairs. It is the basis for the International acceptance of NMS and for calibration and measurement certificates issued by National Metrology Institutes (NMIs).

The application of the SI in South Africa and the development, improvement and maintenance of the NMS are mandated to NMISA in the Measurement Act. NMISA is also tasked to identify and approve other measurement units for use locally and to ensure that the local measurement system is appropriately connected to the International measurement system, through its participation in the Convention of the Metre and its organs, the CIPM and the BIPM.

Participation in International activities at Consultative Committee (CC) and RMO Technical Committee (TC) levels is imperative. These interactions serve to benchmark South Africa's capability to compete in measurement equivalence and impacts directly on NMISA's ability to disseminate traceability for the country.

NMISA disseminates the gazetted NMS through various products and services to not only the South African, but also the Southern African communities. NMISA thus links the South African and Regional measurement system to the International measurement system through its Internationally benchmarked and comparable measurement standards.

The National Development Plan (NDP) and its flagship programmes for industrial development and research, the Industrial Policy Action Plan (IPAP) and the National System of Innovation (NSI), places exacting demands on NMISA and its contributions to the development of Southern Africa. All activities in NMISA are structured to support our mandate and aims to position NMISA to fulfil its National and Regional obligations, as well as to contribute to quality of life at all levels. NMISA makes a contribution to all Government key priorities, including the Nine-point plan to boost economic growth and has aligned its key programmes to the IPAP priority sectors.

Accurate measurement is paramount for fair trade, competitive manufacturing, efficient health care, effective environmental monitoring and law enforcement. The expanding global trade and pressure to eliminate Technical Barriers to Trade (TBTs) creates a constant demand for greater accountability and demonstrated competence in NMIs and plays a leading role in the development of a sound metrology infrastructure in Africa, especially in support of South Africa's immediate neighbours in the Southern African Development Community (SADC). This role is becoming even more important with the advent of a Continental Free Trade Area (CFTA) as standardisation, metrology, conformity assessment and accreditation are the key components in the implementation of Free Trade Agreements (FTA) between countries/economic trade blocks.

A.11 Organisational Structure

NMISA is a Schedule 3A Public Entity, managed by a CEO, supported by an Executive Management team and governed by the NMISA Board:

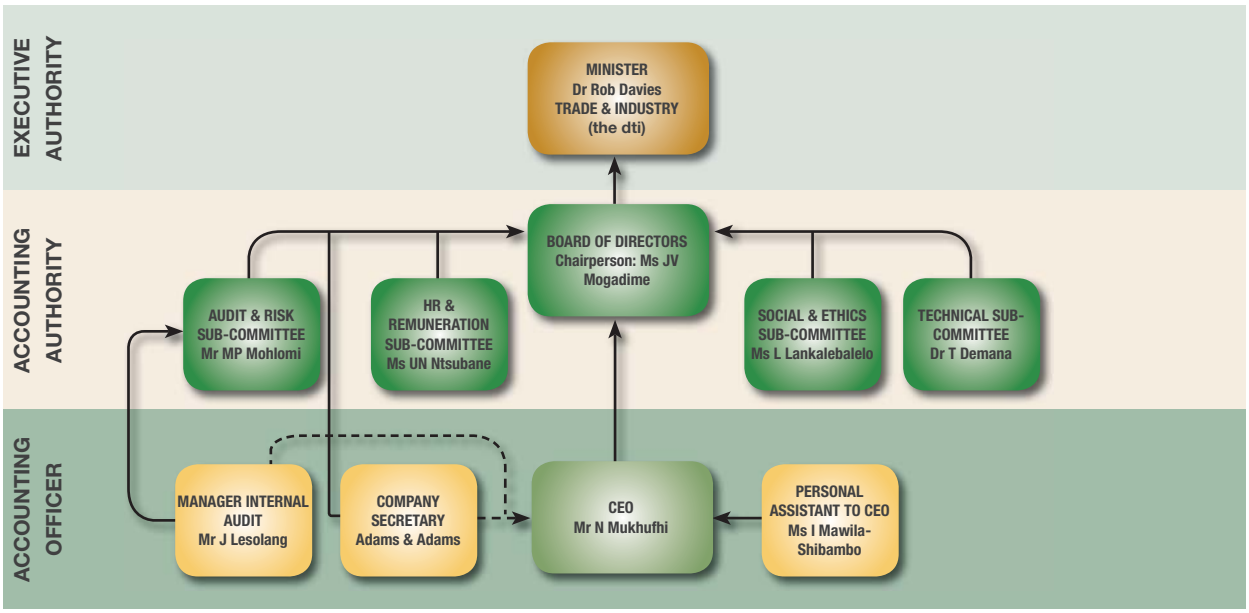


Figure 1. Organisational Structure

PART B:

PERFORMANCE INFORMATION

B.1 Situational Analysis

B.1.1 Service Delivery Environment

NMISA 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 critical to the successful implementation of the FTA and 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. Comparisons of Regional NMI measurement standards are organised to link the Region to the International measurement system through NMISA.

As one of **the dti's** four Technical Infrastructure (TI) institutes, NMISA's activities are critical to the success of the other TIs and support National programmes such as the IPAP. With an increasing focus on local manufacturing, energy and agro-processing, ensuring the quality and safety of imported produce and products is necessary and NMISA's role is expanding to provide not only the physical measurement standards, but to develop and manufacture Certified Reference Materials (CRMs) for testing and manufacturing. This includes:

- Primary reference gas mixtures for environmental monitoring, component manufacturing, health services, ethanol CRMs for law enforcement and the beverage industry,
- Calibration solutions for conformity assessment services and Africa specific matrix CRMs for food safety testing, and
- Proficiency testing schemes are conducted for calibration and testing laboratories in compliance with third party accreditation.

NMISA is also establishing capabilities required for effective implementation of various National regulations.

B.1.2 Organisational Environment

NMISA adheres to a total quality management system and has identified the regulatory requirements applicable to its services, operations and products in order to ensure compliance. NMISA received continued certification of its Occupational Health and Safety (OH&S) and Environmental Management Systems (EMS) to ISO 14001 and OHSAS 18001, which specifies requirements for environmental management and occupational health and safety management systems. NMISA laboratories are accredited to ISO/ IEC 17025, ISO/ IEC 17034 and ISO/ IEC 17043. The Safety, Health, Environment and Quality (SHEQ) department handles all matters relating to health and safety of staff, from ensuring a safe working environment to environmentally sustainable practises.

B.1.3 Strategic Outcome Oriented Goals and Objectives

NMISA is guided overall by **seven goals**, namely:

Goal 1 Keep, maintain and develop the NMS and provide for the use of the NMU,

Goal 2 To ensure that the South African measurement system is Internationally comparable, by participating in the activities of the International Committee for Weights and Measures as per the Mutual Recognition Arrangement (CIPM MRA),

Goal 3 To modernise NMISA's infrastructure and equipment through recapitalisation,

Goal 4 Provide measurement knowledge and expertise as a key component of the Technical Infrastructure with regard to public policy objectives measurement compliance issues in terms of health, safety and the environment,

Goal 5 Provide an integrated human capital development programme for metrology,

Goal 6 Provide essential support to the South African public and private enterprises through dissemination of the NMS, Units and expertise, and

Goal 7 Adhere to the regulatory requirements of a 3A Public Entity and sound corporate governance.

Going forward NMISA will be guided overall by four **strategic objectives**; namely

1 Metrology for Regulatory purposes and in support of Government laboratories, for compliance and for development of regulations,

2 Metrology consolidation for SOEs to provide efficient shared services,

3 Metrology for industry including assistance to SMEs to provide appropriate services in support of manufacturing, beneficiation and export, and

4 Location of Legal Metrology under NMISA to effectively implement the Legal Metrology Act.

B.2 Programme Highlights For 2018/2019

B.2.1 Integrated Value Chain

The voting by member states, during the General Conference on Weights and Measures (CGPM), at its 26th meeting, on the revision of the International System of Units (SI) in November 2018, introduced an increased demand for research and development at NMISA to be able to realise the units independently of our trade partners. The technology of realisation of the units is changing to quantum technologies that necessitates higher qualified staff, more technical and scientific expertise and more collaboration.

During the first session of its 108th meeting, the CIPM elected Dr Wynand Louw from NMISA as their president. The principal task of the CIPM is to promote world-wide uniformity in units of measurement and it does this by direct action or by submitting draft resolutions to the General Conference (CGPM) which is formed of government representatives. He is the first African to be part of the CIPM bureau, positioning the country and the region to influence decisions at a higher level of the measurement chain.

NMISA's activities are organised into Thematic Research Programmes. The technical thematic thrusts aim to support green industries, agro-processing and food safety, enhance manufacturing competitiveness, improve the quality of life through accurate measurement for health care and law enforcement, ensure consumer protection and shorten the traceability chain for Africa. For the revised SI, it also focuses on the provision of traceability to the SI units, and the regional and international integration activities ensures that the realisation of the units, the measurement standards kept by NMISA and the services that are provided to sectors of the economy, are internationally equivalent and comparable.

NMISA's projects are particularly in support of the nine-point plan of the IPAP; the delivery and service environment has now been tailored to report against the matrix structure in the form of programmes underpinned by regional integration and maintenance of the national measurement standards.

Regional Integration and maintenance of NMS underpin the programmes that form the matrix structure of NMISA

Figure 2: NMISA's Thematic programmes

B.2.2 Energy Efficiency

The IPAP declared green industries as a sectoral focus area, involving establishing a strategic National smart vision for the South African Electricity Industry. In support of the IPAP, NMISA's Energy Efficient programme's aim, was to develop and promote measurement capabilities that enable the efficient usage and saving of electrical energy. The following initiatives were undertaken in the year under review aligned to the IPAP vision;

- NMISA established capabilities and is accredited for photometric parameters and calibration of single LEDs, small LED luminaries and modules. To play a role in the S&L programme announced by the DoE particularly the aspect relating to LED retail incentive for promoting energy efficient lighting; "Market Transformation through the Introduction of Energy Efficiency Standards and the Labelling of Household Appliances in South Africa".
- The first ever AFRIMETS comparisons in RF parameters was piloted by NMISA and successfully concluded with the approval of the report by GT-RF and a publication of the results in Metrologia.
- NMISA established an in-house source of traceability for voltage harmonics and established the voltage harmonics calibration capability.
- Improvement of the AC power standard by implementing a digital simultaneous sampling technique to modernise the calibration procedure.

B.2.3 Advanced Measurement Solutions

NMISA established the Advanced Measurement Solutions programme to find new and innovative solutions to existing measurement problems. Scientific advancements in the field of metrology provide accurate and fit-for-purpose solutions that are cost effective.

- The South African time scale accuracy difference to the Coordinated Universal Time (UTC) scale was decreased from 5 000 nanoseconds to 20 nanoseconds, with a corresponding uncertainty decrease from 200 nanoseconds to less than 10 nanoseconds for the MeerKAT project to offer time traceability to South African Radio Astronomy Observatory (SARAO). NMISA continued with the project in the year under review and systems were put in place to transfer data files for daily analysis.

HIGHLIGHTS OVER THE PAST FIVE YEARS:

NMISA maintains the South African Time Scale. Up to five years ago, its capabilities, linked to the Universal Coordinated Time (UCT) maintained by the International Bureau of Weights and Measures, was within 1000 ns of UCT. The SKA required substantially better and explored the sourcing of accurate time from other national metrology institutes such as the NPL of the UK. NMISA embarked on a process to improve its capability and is now within 20 nanoseconds from UTC, an accuracy that allows SKA-South Africa to source its time from NMISA. The high accuracy timescale and consultation work from the NMISA staff assisted in the successful commissioning of the MeerKAT radio astronomy telescope. The MeerKAT telescope has already contributed to astronomy and will soon be expanded to the full SKA. NMISA is continuously improving its time keeping capability and will be able to provide the required services to the SKA. Another project towards this is the establishment of a regional time network in Sub-Saharan Africa -a project that was initiated by NMISA and is expected to be ready in time for the full SKA.

B.2.4 Reference Materials

For the year under review the programme focused on the production of high purity calibration and the certification of matrix reference materials focusing on food and feed.

- In support of law enforcement, NMISA was proactively involved with the Road Traffic Management Cooperation (RTMC) and working with the Johannesburg Metro Police Department (JMPD) to ensure that the evidentiary breathalyzer machines are calibrated and traceable to the International System of Units. The end of December 2018 saw the City of Johannesburg and the JMPD launch the EBAT that provides a printout of a driver's alcohol level immediately after the test is conducted eliminating the need for a blood test. In the last quarter of the 2018/19 financial year EBAT was launched by the Minister in KwaZulu-Natal province in Pietermaritzburg.

HIGHLIGHTS OVER THE PAST FIVE YEARS:

- The Evidential Breath Alcohol Test (EBAT) that provides a driver's alcohol level immediately after the test is conducted was launched in the period under review, therefore eliminating the need for a blood test, minimising the risk of samples being contaminated or lost and allows for obtaining results on the spot without waiting for lab results on blood samples. The approval of these devices for use were developed with significant contribution by NMISA. Only equipment that complies with regulations in terms of the National Road Traffic Act must be used and all equipment must be calibrated by a laboratory accredited to ISO/IEC 17025. Only NMISA is currently accredited and has been proactively involved with the Road Traffic Management Cooperation (RTMC)/ Department of Transport to ensure that the EBAT machines are calibrated. NMISA has developed an artificial lung to ensure that the calibration is a simulation of the real situation and that the tests are accurate.
- RegulationR214 of the South African National Department of Health (NDoH) is aimed at reducing the sodium content in selected food products. Since implementation, several disputes have arisen between the food manufacturers, retailers and product inspectors, resulting from discrepancies between the respective analytical testing laboratories' results for sodium content in food. To resolve this challenge, NMISA has developed a proficiency testing (PT) scheme customised around the South African Sodium in food reduction regulations. A PT scheme provides all testing labs with samples containing qualities only know by the NMISA, the labs are then required to test the sample independently. The results of the labs are then compared to the known qualities of the sample to determine if the lab can calculate results accurately. In this manner, testing laboratories have been able to identify sources of measurement discrepancies and improve on their testing methods.
- Over 230 delegates from 50 countries across Africa and the globe, participated in the Africa Food Safety workshop 2018, hosted by the NMISA and collaborating partners. The workshop promoted adherence to standards, common methods of analysis and improved interinstitutional cooperation for improved food contaminant analysis in support of food safety across the continent, in anticipation of increased intraregional trade in support of the Africa Continental Free Trade Area (AfCFTA).
- The Stockholm Treaty that became effective May 2004, including South Africa as a signatory, aims to protect humans and the environment from chemicals that are persistent and tend to become geographically widely distributed. Since there was no local capability to ensure traceability for the analysis of toxic environmental pollutants such as persistent organic pollutants (POPS) in the country and no capability to analyse for dioxins and furans, NMISA developed an internationally recognised capability to develop methods and ensure traceability for the determination of the presence and levels of these pollutants. Without the capability to monitor dioxin and furans, the country is at risk for products that may contain these toxins, to be banned from international markets. NMISA also established a matrix reference material (RM) production facility and the capability to certify these RMs to an internationally acceptable level. For environmental monitoring, law enforcement and health, NMISA established a primary reference gas mixture (PRGM) preparation and certification capability that supplies more than 100 PRGMs to industry, law enforcement agencies and hospitals.

- South Africa is the first country in the world to implement mandatory sodium reduction regulation in multiple food categories, to minimize the increasing number of non-communicable lifestyle diseases. Since implementation there has been several disputes resulting from discrepancies between respective analytical testing laboratories testing for sodium content in food. NMISA developed a proficiency testing scheme customized around the South African Sodium in food reduction regulation R214 as amended by No 1071(2017). The PT scheme is aimed at identifying discrepancies between laboratory results and address them through improved measurement processes.
- 15% of all border rejections received by African countries from the EU Rapid alert system for food and feed have been mainly for aflatoxins in peanuts. Accurate measurements therefore ensure the correct enforcement of these regulations, protecting the health and safety of consumers and removing any technical barriers to trade. NMISA is a member State that participated in the IAEA AFRA Regional project for the first PT scheme developed within the Africa Food safety network for the determination of aflatoxins in peanut slurry. This work supports Regulations governing tolerance for fungus-produced toxins in foodstuffs and all related Amendments (R751/2009; R1145/2004) under the Department of Health's Foodstuffs, Cosmetics and Disinfectants Act.
- The European Union (EU) remains one of South Africa's main agriculture export destinations. The EU maximum residue level allowed for diphenylamine (DPA) in apples and pears has been reduced to 0.05 mg/kg, as applicable from 01 May 2019. In preparation for the change, NMISA was approached by representatives of the apple industry to assist with a quick turn-around PT scheme. The NMISA-PT-ORG35 pesticides in Apples PT was conducted during August/September 2018. This will assist towards ensuring lower EU MRL levels can be met, thus avoiding/preventing MRL exceedance notifications and recalls of South African agricultural exports.
- NMISA hosted the first Africa Food Safety Workshop attended by 50 countries across Africa and the globe. The workshop aimed to promote standards, methods of analysis and improved interinstitutional cooperation for improved food contaminant analysis in support of food safety across the continent, in anticipation of increased intraregional trade.

B.2.5 Green Economies

The programme focused on the refence measurements required in support of reference material production and environmental, industrial and applied monitoring as well as the development of alternative technologies.

- NMISA collaborated with the South African Grain Laboratory (SAGL) on a project to value assign 'standard samples' used in proficiency testing schemes for the Winter Cereal Trust for 19 trace nutritional and toxic elements for the protection of the South African consumer. The Medical Research Council (MRC) has embarked on a project to update the Condensed Food Composition Tables for South Africa with the latest fortification regulations, because new fortification regulations will be published to also include the fortification of cake wheat flour and baked bread made from cake wheat flour. The MRC contracted the SAGL to perform most of the analyses for the project and the SAGL

HIGHLIGHTS OVER THE PAST FIVE YEARS:

The water PTS was jointly developed by the PTB and SADCMET (through NMISA's Regional and International office). The PT has now been running successfully for more than 10 years and have progressed to be run independent from PTB funding – an African success story. The laboratory participated in the SADCMET Water PT Round no. 15 in 2018/2019.

Additive manufacturing requires new measuring techniques for quality control. NMSIA established an additive manufacturing capability to research measuring techniques for additive manufacturing in support of this flexing industry. The world-class materials characterisation facilities at NMISA will further support this industry of the future.

in turn subcontracted the NMISA Inorganic Analysis Laboratory to perform the analyses that they cannot perform in-house. The first part of the project was completed in 2018/2019.

- The International Committee on Reference Materials (ISO/REMCO) are developing new guidance for the production of high purity reference materials and the production of qualitative reference materials. The South African Committee for Reference Materials (SABS TC 1046) are playing an active role in the working groups established for the new guides. NMISA expert participated as members of the working group responsible for developing the new guide for the production of high purity reference materials for small organic molecules.

- The SADCMET Water proficiency testing (PT) scheme is an annual PT that is being coordinated through SADCMET. The majority of participating laboratories (typically more than 70 laboratories) are from the testing field and represent 19 African countries.

- NMISA's FIBSEM lab assisted industry clients to identify the causes of failures within their respective production lines. The following are NMISA's contribution to industry;

- NMISA provided direct support to the quality control aspect of food packaging through its advanced focused ion beam scanning electron microscope to investigate the type and origin of contaminants within food and the packaging itself. The advanced elemental analysis of the food packaging and contents allows local food-processing manufacturers to establish where in their production line the contamination occurred and thereby assuring quality control. NMISA is currently the only institution in Africa that offers the service of low energy elemental mapping of sample surfaces using windowless EDS analysis, a vital capability for high level failure analysis in support of South Africa's food-processing sector. The dti recognises the food-processing sector as the largest manufacturing sector in terms of employment. Quality control, in particular food packaging, is a significant aspect that supports the technical process required to ensure a thriving local food-processing sector

- Quality control is essential in monitoring the suitability of especially imported car parts in the automotive sector. NMISA, through its materials characterisation services, provided microscopy-based analysis to support quality control and product development within South Africa's automotive industries. The analysis services revealed exactly where a fault occurred within the production line. The high level of quality expected from the South African automotive industries attest to the superior level of expertise and manufacturing that these local companies have and further cautions against the outsourcing of production as cost cutting measures.

- In support of the railway transport sector, NMISA provided advanced microscopy-based services that revealed failures within the materials that composes the electrical contact pins and copper cables to determine the causes of failures that can lead to disruptions. The findings inform the relevant industry on how to intervene to prevent future electrical communications and cabling failures.

- The materials analysis section provided high level mineralogy analysis to the CGS. The findings contribute to the DMR National Project on the effort of rehabilitating derelict South African mines, especially identifying and monitoring asbestos that could possibly originate from the mines and spread to the surrounding environment and communities.

B.2.6 Revision of the SI

The International System of Units (SI) defines the system of measurement globally and for a country to be connected to the International Measurement System, it must adhere to and apply the SI. Each of the 7 base units of the SI (kilogram, metre, kelvin, ampere, candela, mole and second) has a definition of how to realise the unit in a primary way and thus to establish a NMS directly traceable to the SI. Of the 7 base units, the kilogram, ampere, kelvin and mole will be defined by choosing exact numerical values for the Planck constant, the elementary electric charge, the Boltzmann constant, and the Avogadro constant, respectively. In November 2018 member states voted for the revision of the SI. NMISA in preparation for the revision decided to invest in the two technologies (the Kibble/Watt balance and the Silicone (Si)-sphere that will be used as primary standards for mass.

- For the Kibble balance, NMISA explored collaborations with the National Physical Laboratory (NPL), UK's National Measurement Institute, and the National

Institute of Standards and Technology (NIST) in the USA. NMISA and NPL signed a co-operation agreement on the development of a table-top Kibble balance. This collaboration will assist NMISA with having their own primary standard for mass. Two NMISA metrologists spent about 6 months each during the development phase of the project at the NPL.

B.2.7 Manufacturing Competitiveness

The manufacturing industry is the single largest sector in South Africa and is critical for the growth of the country. Many large Original Equipment Manufacturers (OEMs) of the automotive sector invest billions of rands in South Africa. NMISA ensures it can supply traceability to measurements required.

- In the year 2018/19 NMISA re-established the torque calibration facility. Torque measurements are critical in assembly plants. The installation of the 20kN.m torque rig was successful, and calibrations were performed using the new rig. The laboratory aims to obtain accreditation by 2020.
- Modern industry requires measurement of time dependent acceleration, and this required calibration of accelerometer's shock sensitivity. NMISA has successfully extended its primary capabilities to span 0,1 Hz up to 20 kHz for the Vibration NMS. The organisation will apply for accreditation for the service during 2020.
- Additive manufacturing particularly Three-Dimensional printers is one of the fastest growing technologies in the manufacturing industry, NMISA supported the industry through reference measurements of mainly dimensional accuracy and material characterisation. The length NMS supports measurements of additively manufactured parts and the measurements of surface texture was used to evaluate the surface finish of the printed parts. NMISA's service allows for non-contact measurements of surface roughness of printed parts in 2D and 3D to support additive manufacturing.

B.2.8 Quality of Life

- Nuclear medicine uses radionuclides in medicine for diagnosis, staging of disease, therapy and monitoring the response of a disease process. One of the radionuclides used in our National hospitals is iodine-131 (I-131). Iodine 131 is primarily used to study the functioning of the thyroid though it can also be used in the treatment of hyperthyroidism as well as thyroid cancer. NMISA supplied calibrated I-131 capsules to the South African nuclear medicine departments for a comparison exercise. This exercise was to determine their capability at measuring the accurate dose using their own instrumentation. Their results were communicated to NMISA and each participant was given feedback on how they performed. This assists in ensuring quality in measurements at these departments, thus contributing to quality health care.
- For the Si-sphere NMISA collaborates with the PTB, the National Metrology Institute of Germany. In 2017 the PTB loaned their Si-sphere to NMISA and further extended the loan for another year from July 2018 for NMISA to do comparison studies by weighing both the NMISA and the PTB Si spheres in a mass comparator. This project is ongoing.

HIGHLIGHTS OVER THE PAST 5 YEARS:

The manufacturing industry use various types of machine tools, lathes and milling machines to manufacture metal parts for the automotive industry and all large engineering industries. After manufacturing the parts must be inspected to the original design using different Coordinate Measuring Machines (CMM). In response to the need of this industry for better accuracy, NMISA implemented a new laser tracer system to calibrate the machine tools and CMMs, and a new high-resolution CMM as a standard for CMMs. Without this capability the industry will have to source traceability internationally, resulting in substantial costs and delays. The capability also gives NMISA the capability to do accurate large dimensional measurements that is needed for passenger rail cars and locomotives.

To shorten the traceability chain for Africa, the Length laboratory acquired a gauge block comparator. This allows dissemination of the metre to the South African industry and NMIs in Africa through the calibration of lower gauge blocks. NMISA has applied for accreditation and hopes to obtain this by 2020.

- NMISA is expanding its service into beverage manufacturing after requests by a local beverage company. A capability was set up to measure the sugar content since the inception of the sugar tax.

- NMISA continues to support the regulators in implementing their mandate. Environmental samples from nuclear facilities that are regulated under the NNR Act were measured to give independent confidence to the regulator on the samples provided. This is part of the requirements for license holders in ensuring safety of the environment from nuclear application activities. NMISA continued to engage the regulator to ensure that their measurement traceability needs are identified and met at the highest level, thus shortening the traceability chain for their measurements.

  NMISA continued to participate in International comparison to support services provided to the regulator. Some of the studies included measurement of the activity of Cs-137 and Cs-134 in wheat flour and the IAEA-TEL-2018-03 worldwide proficiency test on the determination of anthropogenic and natural radionuclides in water and soil. These are crucial for affirming our capability for protection of the environment and humans inhabiting in the vicinity of nuclear facilities.

- For patients, the public and workers exposed to radiation, measuring their dose is paramount. To promote standardization worldwide, more than 100 specialists from 65 countries gathered at the International Atomic Energy Agency (IAEA), 17–21 December 2018, for the largest-ever training course on establishing and managing laboratories that provide calibrations for dosimeters, the devices that are used to measure and detect radiation. Organized by the IAEA, the course was part of a series of activities co-ordinated with the World Health Organization (WHO) to support a network of 86 dosimetry laboratories in 72 countries. NMISA forms part of this network and has experts that were requested to provide lectures during this course, and in this manner, NMISA shared its expertise with the world.

- As a Regional designated centre under the IAEA technical co-operation programme, for African countries, NMISA hosted and trained scientists from Kenya for a few months, on establishing measurement capabilities in a dosimetry laboratory, and establishing their total quality management system in line with the ISO/IEC 17025.

HIGHLIGHTS OVER THE PAST 5 YEARS:

- A radio-analytical laboratory was established, with measurement capabilities of low-level radioactivity in environmental samples taken around Koeberg Nuclear Power station. This project is a joint venture with the National Nuclear Regulator (NNR) which will continue to monitor samples from the Koeberg area.

- In support of the health sector, NMISA established capabilities that have helped hospitals to calibrate equipment that is used during the diagnostic procedures to determine if a patient has cancer and the stage thereof. This has assisted service providers to optimise chemotherapy and/or radiation doses given to patients who undergo procedures like x-ray, CT scans and mammography to ensure that the image is of good quality that the doctors can diagnose accordingly whilst ensuring that the radiation dose received is optimised. As new technology in the treatment of cancer has been introduced over the past few decades, risks of radiation accidents and mistreatment have also increased and this necessitated assurance of quality in radiotherapy to protect patients undergoing cancer treatment. NMISA established an independent external quality radiation dose audit which is recognised as part of an effective method of checking that the quality and accuracy of activities in individual radiotherapy hospitals are suitable for achieving the required objectives of cancer care.

B.2.9 Commercialisation

NMISA's maintenance and product development is captured under various research programmes. Once matured and comprise a service, the projects including dissemination services associated with traceability to the NMS are managed under the commercialisation programme.

- NMISA's application to provide the National Certificate: Metrology was approved by Energy and Water Sector Education and Training Authority (EWSETA). This achievement means that NMISA can now offer training of Metrology related courses/standards with the aim of providing the competency certificate at NQF level 5.

- As part of the organisation's commercial services programme, NMISA has been subsequently hosting successful TAFs to inform and educate industry about various areas of metrology.

B.2.10 Regional Integration (RI)

NMISA organised a meeting of the AFRIMETS metrology in Chemistry Technical Committee (TCQM) during the Africa food safety workshop. The meeting concluded to further traceability issues in analytical testing in Africa. NMISA will be driving the development of metrology in chemistry on the continent. NMISA partnered with Ethiopia, Kenya, Egypt and Ghana for the development of fit for purpose matrix reference materials for maize, ground nuts, cassava and other export products such as tea and coffee.

- The AFRIMETS unifies the metrology system in Africa. NMISA as AFRIMETS secretariat successfully organised the 12th Intra Africa Metrology System (AFRIMETS) General Assembly that took place in Enugu, Nigeria. The 2018 GA accepted South Sudan as the 46th member country of AFRIMETS and approved the United Arab Emirates as an associate member of AFRIMETS.

  NMISA was a consultant to UNIDO for the building of the new National Institute of Nigeria. During the AFRIMETS GA, UNIDO approached NMISA for further consultancy to develop a maintenance workshop for metrology equipment in Nigeria.

- NMISA is an associate member of the Asia Pacific Metrology Programme (APMP) and participates in the APMP activities because of the African Regional Metrology organisation, AFRIMETS. AFRIMETS is currently not in a position to form technical committees for some parameters due to lack of expertise in the

HIGHLIGHTS OVER THE PAST 5 YEARS:

- Since 2013 NMISA has assisted 7 SADC Associates of the General Conference of Weights and Measures (CGPM) and this participants in the Metre Convention to build capacity and improve their measurement capabilities which has enabled them to submit calibration and measurement capabilities (CMCs) for publication in the international database of CMCs, the KCDB. The following countries have successfully registered CMCs: Botswana (3 CMCs in temperature), Namibia (7 CMCs in Mass), Zambia (11 CMCs in temperature) and Zimbabwe (17 CMCs in Mass and temperature).
- NMISA has the responsibility of ensuring that measurements done in South Africa and the SADC region can be traced to the International System of Units (the SI) via primary realisation of the base units and dissemination of traceability to secondary standards at accredited calibration laboratories and the SADC NMIs, thereby helping to facilitate regional integration and trade through acceptance of products, processes, measurements and testing in the local market and the region. With the only capability at this stage in Sub-Saharan Africa to realise the base units according to the rules of the CIPM, NMISA is also the source of traceability for other sub-regions in Africa.
- To perform this role, NMISA need to participate in the activities of the consultative committees (CCs) of the CIPM that define the rules and procedures for the realisation of the SI. The CCs are the highest-level international organs that deal with measurement equivalence in the technical fields and membership (given based on technical expertise in the field), allows input to policy at the highest level, and for participation in the highest-level international comparison of national measurement standards. Without this membership, the NMI is relegated to participate in a second-tier system at regional metrology organisation level.
- NMISA has now attained full membership of 8 of the 10 CCs, partial membership of the CC for ionising radiation and guest membership of the CC for units (CCU) through the election of Dr Louw from NMISA, to the Presidency of the CC for Ionising Radiation (CCRI). Only two other countries in Africa has limited (1 or 2) memberships of CCs and NMISA thus provide the link for the continent to the international measurement system. In March 2019 Dr Louw was elected to the Presidency of the CIPM, only the third time since the Metre Convention of 1875 that the Presidency is from outside Europe and the first time for an African. With this NMISA has reached the highest level of strategic participation possible in the international measurement system. This allows for not only South Africa but Africa to play a meaningful and even leading role in the process to establish global equivalence of measurement. At the practical level it is the vehicle for international recognition of the measurement capabilities of the region, contributing to efficient manufacturing and enabling trade of products.
- NMISA thus plays an important role with the establishment of metrology systems on the continent for the AfCFTA, and safeguards the interests of South Africa and SADC within the system.

region, as NMISA is the only country with capabilities at the highest level. NMISA participates in inter-laboratory (NMI) comparisons in the field of Time and Frequency, Photometry and Radiometry, Length, Electricity and Magnetism and Ionising Radiation organized by APMP technical committees.

NMISA also participates in the APMP activities for marketing and political purposes to connect with trade partners such as China, India, Japan, South Korea, Australia etc. NMISA is also eligible for funding under the Development Economies Programme (DEC). NMISA management attended the DEC, Directors meeting and the opening session of the General Assembly.

- The AOAC Sub-Saharan Africa represents 49 African countries. The newly established section is dedicated to promoting and advancing the knowledge and best practices in the analytical sciences. The AOAC Sub-Saharan Chapter aims to serve as an independent and impartial scientific advisory body to develop the necessary infrastructure to ensure easy access to reagents, consumables, instrumentation and maintenance required to sustain testing performance standards. NMISA, serving on the Executive Board is collaborating with the Chapter to support South African trade and industry through the provision of reference analyses, the development of reference methods as well as the preparation and certification of reference materials and standards. These products and services are the tools that chemical and food testing laboratories use to ensure the quality of the measurements they deliver in support of food safety and environmental pollution monitoring.

B.3.1 Performance Information

NMISA has adopted a balanced scorecard approach to set and measure performance targets. NMISA is composed of four key components, namely stakeholder/ customer, learning and growth (organisational development), innovation and business processes and financial perspective.

Scorecard Outline

Stakeholder and Customer Perspective	• Trusted business partner and service excellence, • Improved turnaround time and response time and • Increase customer satisfaction, thereby increasing referrals.
Learning and Growth (Organisational development) Perspective	• Improve staff qualification profile, • Transformation (establish pipeline of future skills), • Create management systems (career ladders, performance management etc.) and • Communication (staff meetings, section head forum, staff communique etc.).
Innovation and Business Processes	• Establish long-term multi-divisional anchor research programmes, • Implement systems to manage and protect NMISA IP and • Align and integrate systems and processes.
Financial Perspective	• Financial growth and stability (broaden revenue mix), • Effective financial controls and • Decrease costs of delivered products and services.

NMISA Scorecard

Performance Indicator	Actual Achievement 2017/2018	Planned Targets 2018/2019	Actual Achievement 2018/2019	Variance from planned targets for 2018/2019	Comments on Variance
National Obligations					
Strategic Objectives 1: Keep, maintain and develop the NMS and provide for the use of the NMU.					
Gazetted NMU.	Update schedule 1 (SI units) and submit to **the dti** to gazette.	Develop and submit Annual Report to **the dti** to gazette.	Official report submitted to **the dti.**	None	None
Number of NMS maintained submitted to **the dti** to Gazette.	62	58	60 maintained	2	None
Number of improved NMS, secondary standards, reference materials and methods	20	19	19	None	None
Strategic Objective 2: To ensure Internationally recognised and comparable NMS and Units by participating in the Metre Convention, CIPM MRA and AFRIMETS activities					
Number of memberships of International committees for Weights and Measures CIPM and Consultative Committees (CC).	10	9	10	1	NMISA was an observer member of CCRI but gained honorary membership through the presidency of CCRI.
Number of accredited laboratories accredited to ISO 17025 or ISO 17034, ISO 17043 and/or peer reviewed quality system.	20	21	21	None	None
Number of Calibrated Measurement Capabilities (CMCs) as published in the Key Comparison Database (KCDB).	494	497	533	36	The recording of additional CMCs in the KCDB is independent of NMISA, thus timing cannot be reliably determined.
Strategic Objective 3: To modernise NMISA's infrastructure and equipment through recapitalisation					
Strategic Objective 4: Provide measurement knowledge and expertise as a key component of the Technical Infrastructure with regard to public policy objectives measurement compliance issues in terms of health, safety and the environment					

NMISA Scorecard (continued)

Performance Indicator	Actual Achievement 2017/2018	Planned Targets 2018/2019	Actual Achievement 2018/2019	Variance from planned targets for 2018/2019	Comments on Variance
Number of refereed and/or peer reviewed publications.	New KPI	10	13	3	Publications are dependent on acceptance by the publishers. Publications submitted by NMISA were successfully published.
Number of articles, application, conference proceedings or technical notes published.	New KPI	12	20	8	Publication is dependent on acceptance by the publishers, NMISA's work was successfully published.
Strategic Objective 5: Provide an integrated human capital development programme for metrology					
Number of interns and in-service trainees hosted.	20	15	27	12	Additional in-service trainees were hosted through NMISA collaboration with Tshwane University of Technology.
Percentage of filled funded vacancies.	95%	95%	97%	3%	Planned vacant positions that were funded were filled.
Strategic Objective 6: Provide essential support to the South African public and Private Enterprises through dissemination of the NMS, Units and expertise					
Income generated from dissemination activities.	R20 642 033.47	R31 000 000	R22 147 616.13	R8 852 383.87	Planned revenue generation projects were not concluded due to ineffective implementation and monitoring from client departments and SOEs. The Department of Health Gas Analysis project planned for R7 000 000 was not realised. In addition, the reference material sales planned for R4 million was not realised due to the delay in delivery of raw materials by CSIR.
Percentage customer satisfaction.	≥95%	≥95%	≥99.6%	4.6%	NMISA actively engages clients serviced and keeps in touch with complainants to address issues.

NMISA Scorecard (continued)

Performance Indicator	Actual Achievement 2017/2018	Planned Targets 2018/2019	Actual Achievement 2018/2019	Variance from planned targets for 2018/2019	Comments on Variance
Number of industry and/or Regional metrologists trained in accurate measurement.	100	96	152	56	Due to the unplanned training in Q1 as a response to the Africa Food safety workshop.
Number of courses presented to industry.	24	16	22	6	Due to additional unplanned request for training.
Strategic Objective 7: Comply with government directives, the PFMA, treasury regulations and regulatory issues in terms of Government regulations.					
Actual expenditure to budget.	103%	98%	106%	8%	The percentage expenditure to budget includes surplus granted by National Treasury incurred above budget.

PART C:

GOVERNANCE

C.1 Introduction

Corporate governance is an exercise of ethical and effective leadership by the Board of NMISA towards effectively achieving the controls as outlined in the King Codes of Corporate Governance. These include the need for an annual Integrated Report that focuses on the impact of the organisation in the economic, environmental and social spheres. A statement by the Audit Committee to the Board and shareholders on the effectiveness of internal financial controls to be included in the Integrated Report, the consideration of the strategic role of IT and its importance from a governance perspective, the positioning of internal audit as a strategic function that conducts a risk-based internal audit and provides a written assessment of the company's system of internal control, including internal financial controls and the governance of risk through formal risk management processes.

C.1.1 Executive Authority

Mr Ebrahim Patel, Minister of Trade and Industry, who is accountable to Parliament for NMISA as defined in section 1(c) and (d) of the PFMA.

C.1.2 The Accounting Authority/ Board Charter

The purpose of this document is to set out the mission, duties and responsibilities of the Board of Directors of the National Metrology Institute of South Africa (NMISA). The Board of Directors is the NMISA's Accounting Authority in terms of the Public Finance Management Act, No 1 of 1999 (PFMA). A summary of the contents of this Board Charter will be disclosed in the NMISA's Annual Report.

As recommended by the King Codes of Corporate Governance, the Board has a charter setting out its responsibilities, which are disclosed in its Annual Report. At a minimum, the charter confirms:

- The Board's responsibility for the adoption of Strategic Plans,
- Monitoring of operational performance and management,
- Determination of policy processes to ensure the integrity of the Public Entity risk management and internal controls, and
- Communication policy, and Director selection, orientation and evaluation.

C.1.3 The Board

The Board of Directors consists of the following individual members:

Names	Date of appointment	Designation	Total no. of meetings	Total no. of meetings attended
Ms Jabu Mogadime	05/04/2013	Chairperson	6	5
Ms Ursula Ntsubane	01/03/2015	Non-executive member	6	3
Ms Nobom Mfabana	01/07/2018	Non-executive member	6	6
Dr Tshenge Demana	05/05/2013	Non-executive member	6	6
Ms Lindie Lankalebalelo	01/07/2018	Non-executive member	6	6
Ms Bavelile Hlongwa	01/07/2018	Non-executive member	6	5
Mr Ndwakhulu Mukhufhi	01/07/2018	Ex officio member	6	6
Mr Odirile Dingoko	01/07/2018	Non-executive member	6	6
Mr Petrus Mohlomi	01/07/2018	Non-executive member	6	6

C.1.3.1 Sub Committees of the Board

C.1.3.1.1 Audit and Risk Committee

Names of members	Designation	Total number of meetings held	Total number of meetings attended
Mr Petrus Mohlomi	Chairperson – Non-executive member	2	2
Ms Ursula Ntsubane	Non-executive member	2	1
Mr Myeza	Independent Non-executive member	0	0
Ms Lindie Lankalebalelo	Non-executive member	2	1
Ms Romeshni Govender	Independent Non-executive member	0	0

C.1.3.1.2 Social and Ethics Committee

Names of members	Designation	Total number of meetings held	Total number of meetings attended
Ms Lindie Lankalebalelo	Chairperson – Non executive member	2	1
Mr Odirile Dingoko	Non-executive member	2	2
Ms Nobom Mfabana	Non-executive member	2	2
Mr Ndwakhulu Mukhufhi	Executive member	2	2

C.1.3.1.3 Technical Committee

Names of members	Designation	Total number of meetings held	Total number of meetings attended
Dr Tshenge Demana	Chairperson – Non-executive member	2	2
Ms Bavelile Hlongwa	Non-executive member	2	1
Mr Ndwakhulu Mukhufhi	Executive member	2	2
Mr Odirile Dingoko	Non-executive member	2	2

C.1.3.1.4 Human Resources and Remuneration Committee

Names of members	Designation	Total number of meetings held	Total number of meetings attended
Ms Ursula Ntsubane	Chairperson Non-executive member	2	1
Dr Tshenge Demana	Non-executive member	2	2
Ms Nobom Mfabana	Non-executive member	2	2
Mr Ndwakhulu Mukhufhi	Executive member	2	2

C.1.4 Risk Management and Internal control

Legislating the implementation of risk management in Public Sector institutions is part of a macro strategy of the South African Government which aims to ensure achievement of Public Sector institutional goals and objectives. This mandate of the NMISA can be found in Section 76 of the Public Finance Management Act 1 of 1999 as amended by Act 29 of 1999, Treasury Regulations TR3.1.10, and Treasury Regulations TR3.1.13. Risk management therefore forms an integral part of the Institute's plan to deliver effectively and efficiently on its mandate.

The Board is responsible for determining the policies and processes necessary to ensure the integrity of risk management and internal controls. The Board ensures that a formal risk assessment is undertaken annually to identify and evaluate key risk areas. The Board also ensures that it continually reviews and forms its own opinion on the effectiveness of the risk management process.

The Audit and Risk Committee (ARC) assists the Board in reviewing the risk management process and the significant risks facing NMISA.

The Board's risk management policy is clearly communicated to all employees to ensure that the risk strategy of the Board is incorporated into the language and culture of NMISA. NMISA continues to recognise the importance of risk management to ensure realisation of objectives and therefore endeavours to comply with legislation as it pertains to its risk management.

C.1.5 Compliance with laws and regulations

Compliance with legislation and industry norms and standards is one of the many duties of the board.

Compliance in relation to corporate and financial related compliance issues are the responsibility of the Chief Financial Officer (CFO). The Chief Executive Officer (CEO) has overall, ultimate responsibility to monitor and ensure institutional and financial compliance. The Chairperson has executive authority, responsible for overall strategic and governance oversight.

NMISA, as a schedule 3A Public Entity, needs to comply with the provisions of the PFMA, the Measurement Act and the Companies Act, and in this regard, compliance is on par with similar Public Entities. Although compliance with the prescripts of the King Code on Corporate Governance is not legislated, it has become an industry accepted norm, and in this regard NMISA is compliant about those aspects of the code that are applicable to Public and/or State-owned entities (SOE's).

C.1.6 Fraud and corruption

NMISA had no fraud or corruption investigations nor cases for the 2018/19 financial year.

C.1.7 Minimising conflict of interest

A register of declarations of interest for NMISA management is kept and updated annually, with an opportunity for declaring changes, or interests that affect the day's proceedings, at all Board, Committee and EXCO meetings. In addition to the Director's personal interest, Directors also disclose interests of their spouses, partners or close family members.

Full disclosure of the nature of a Director's interest on any matter before the Board is required.

A director, or any organisation he/she may represent , is disqualified, by his/her office in NMISA, from contracting with NMISA.

C.1.8 Code of conduct

NMISA is committed to a policy of **fairness**, **transparency**, **honesty**, **impartiality**, **objectivit**y, **credibility, integrity** and, above all, **accountability**, in the conducting of all its business affairs, both inside and outside the organisation. This commitment is based on a fundamental belief in honest, fair and legal conduct in all business activities.

Employees are expected to share this commitment to high moral, ethical and legal standards. The purpose of this document is therefore to lay down a strict ethical code with which each employee, contract employee and consultant is required to comply.

Failure to comply with this Policy amounts to misconduct and is dealt with in terms of NMISA's Disciplinary Code.

C.1.9 Health, Safety, Environmental and Quality

NMISA's Total Quality Management System (TQMS) is primarily based on the ISO/IEC 17025 standard, which is Internationally acceptable for the competence of testing and calibration laboratories.

C.1.10 Company Secretary

NMISA has appointed Adams and Adams as a service provider to provide necessary board support and ensures NMISA's board operates in line with the requirements of the principles of good governance as guided by the King Code.

The Company Secretarial Service Provider serves as the direct channel of communication to the Chairperson of the Board and provides comprehensive practical support/ guidance to the Board Chair and Committee Chairpersons in the proper compilation/timely circulation of Board papers for the Board and its Committees. It is the responsibility of the Company Secretarial Service Provider to assess training needs of Board members and executive management regarding fiduciary/governance responsibilities.

The Company Secretarial Service Provider assists the Board in the evaluation process of Board members and executive management.

C.1.11 Social Responsibility

C.1.11.1 NMISA's "adopt a school" initiative

NMISA continued its engagements with its HCD partner Greater Lebaka Education Enrichment Initiative (known as Kheale Centre). Metrologists have over the review period visited the centre, give lessons and young Metrologists prepared experiments for the high school learners.

C.1.12 Audit Committee Report

REPORT FROM THE AUDIT AND RISK COMMITTEE CHAIRPERSON

C.1.12.1 Legislative requirements

The Audit and Risk Committee (ARC) herewith presents its report for the financial year ended 31 March 2019, and was duly constituted as required by section 77 of the PFMA, 1999 (Act No. 1 of 1999, as amended by Act No. 29 of 1999) (PFMA) read with Treasury regulation 27.1.10.

C.1.12.2 Audit and Risk Committee's responsibility

The ARC has complied with its responsibilities arising from section 51(1)(a)(ii) of the PFMA read with Treasury regulation 27.1.8. The ARC was regulated by an approved Terms of Reference which is aligned with the requirements of the PFMA (1999, as amended), Treasury Regulations and King IV. The Committee satisfied its responsibilities for the year, in compliance with its Terms of Reference.

C.1.12.3 Audit and Risk Committee (ARC) members and attendance

The ARC Terms of Reference (Tor) require that the ARC comprises a minimum of three non-executive Board members elected by the Board and one external member. In terms of section 77(b) of the PFMA, the ARC must meet at least twice a year. During the financial year ended 31 March 2019, the ARC met on two occasions. The table below shows the attendance of these meetings:

Name	Date of appointment	Qualifications	Number of meetings scheduled	Number of meetings attended
Mr P Mohlomi	1 July 2018	• MBL, • BSC: Microbiology, Biochemistry and • National High Diploma: Microbiology.	2	2
Ms L Lankalebalelo	1 July 2018	• LLB, • Postgraduate Certificate in Legislative Drafting Postgraduate and • Certificate in Corporate Law.	2	1
Ms U Ntsubane	01 March 2015	• Masters: Development Planning, • Postgraduate Diploma: Personnel Management and • Bachelor of Social Science.	2	2
Ms R Govender	19 November 2018	• Bachelor of Accounting. • Post Graduate diploma in Accounting and • CA (SA); CIA; CCSA; CRMA.	2	0
Mr Z Myeza	19 November 2018	• BCOM: Accounting and Auditing and • MBA.	2	0

C.1.12.4 Effectiveness of Internal Control

The ARC considered reports issued by the various assurance providers taking combined assurance into account, and acknowledges management's efforts to strengthen internal controls. The ARC is concerned that in certain instances, the matters reported by the internal audit function in prior years have not been fully and satisfactorily addressed. Management has provided assurance that effective corrective action will be implemented in respect of all internal control weaknesses, and the ARC will monitor these going forward. In light of the above, we report that the system of internal control for the period under review is considered to have been generally adequate and effective.

C.1.12.6 Internal audit function

The ARC is responsible for the appointment, compensation, retention and oversight of the Internal Auditors. The Chief Audit Executive function operates within the ambit of the Internal Audit Charter approved by the ARC. The Internal Audit function reports functionally to the ARC and operationally to the Accounting Officer.

The ARC has approved a risk-based three-year rolling Internal Audit Plan in the 2018/19 financial year. The Committee is reasonably satisfied with the effectiveness and independence of the Internal Audit function. The internal audit also reported on overall control environment and fraud hotline activities of the NMISA during the year.

Internal audits completed covered all planned audits and provided appropriate remedial actions to management in order to enhance the control environment.

C.1.12.7 Risk Management function

The ARC is responsible for the oversight of the risk management function. Management reports to the ARC on the management of risks. The ARC is generally not satisfied with the maturity of the risk management.

C.1.12.8 Evaluation of the finance function

The Committee is of the opinion, based on the information and explanations provided by management, as well as the results of audits performed by the internal auditors, and NEXIA SAB&T, that the financial information provided by management to users of such information is adequate, reliable and accurate.

The quality of in-year reports received from the finance function was commendable. The ARC is satisfied with the effectiveness of NMISA's CFO and the finance function.

C.1.12.9 Performance Management

Part of the responsibilities of the ARC includes the review of performance management. The ARC has performed the following functions:

- Reviewed and commented on the alignment of the Annual Performance Plan (APP), Budget, Strategic Plan, and Performance Agreements,
- Reviewed and commented on the relevance of indicators to ensure that they are measurable and relate to functions of NMISA,
- Review of reported non-compliance with legislation,
- Review of compliance with in-year reporting requirements,
- Review of the quarterly performance reports submitted by the internal audit function and
- Reviewed and commented on the performance management system and making recommendations for its improvement.

The ARC is satisfied that the Performance Report has been prepared in terms of the PFMA, the Treasury Regulations and any other related regulatory requirements for reporting performance.

C.1.12.10 Evaluation of the Annual Financial Statements (AFS)

The ARC has reviewed the Annual Financial Statements (AFS), which focused on the following:

- Significant financial reporting judgements and estimates contained in the AFS,
- Clarity and completeness of disclosures and whether disclosures made have been set properly in context,
- Quality and acceptability of, and any changes in, accounting policies and practices,
- Compliance with accounting standards and legal requirements,
- Significant adjustments and/or unadjusted differences resulting from the audit,
- Reflection of unusual circumstances or events and management's explanation for the accounting treatment adopted.
- Reasons for major year-on-year fluctuations,
- Asset valuations and re-valuations,
- Calculation and levels of general and specific provisions,
- Write-offs and reserve transfers and
- The basis for the going concern assumption, including any financial sustainability risks and issues.

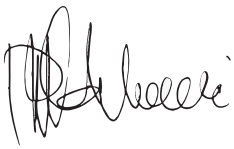
The ARC is comfortable that the AFS have been prepared in terms of the Generally Recognised Accounting Principles (GRAP) and the PFMA.

C.1.12.11 External Auditor's Report

The ARC concurs with and accepts the conclusion and audit opinion of the external auditors on the AFS. The committee is of the view that the audited financial statements be accepted and read together with the report of the external auditors. The Audit Committee confirms that it has been actively involved throughout the audit process.

The external audit function, performed by NEXIA SAB&T, is independent of the entity. The ARC has met with the external auditors to ensure that there are no unresolved issues and acknowledges the diligence and co-operation of the external audit team.

On behalf of the ARC:



Mr Petrus Mohlomi
Audit and Risk Committee Chairperson
National Metrology Institute of South Africa
31 July 2019

PART D:

HUMAN RESOURCE MANAGEMENT

D.1 Management Review

NMISA Human Resources(HR) initiatives are geared towards maximising potential of employees by creating an enabling working environment that would attract, inspire excellence, develop, and retain a highly competent workforce with the requisite technical and professional skills. To this effect the Human Resources (HR) Department had to reposition itself as a business partner that will deliver value adding solutions to ensure that the organisation's objectives and plans are achieved. Human Resources (HR) business partners especially those who have recently joined the organisation, spent more time with management and employees in their respective business units to get a better understanding of the business and how they can better support their strategic goals and objectives. Work alignment sessions were arranged for some of the units to ensure cohesion and improved service delivery.

D.1.1 Investing in NMISA's People

D.1.1.1 Human Capital Development

Our Human Capital Development (HCD) programme seeks to enable effective delivery of NMISA's strategic thrusts through recruiting, developing and empowering talent, thus positioning the institution as an employer of choice.

Some of the successes within our HCD program include three NMISA MSc students and one undergraduate student completing their degrees during the 2018/19 fiscal year.

D.1.1.2 Integrated HCD and Quality

NMISA has an integrated Human Capital Development(HCD) programme to enhance the organisation's profile. NMISA educates the youth of South Africa on career prospects and funding opportunities in the field of metrology.

D.1.1.3 Employee Wellness Program

NMISA provides an integrated wellness programme to its employees which includes counselling services on the following:

- Stress,
- Work issues,
- Financial issues,
- Legal issues,
- Relationships,
- Family matters and
- Health issues.

The wellness programme was successfully launched and there has been a notable increase in the utilisation rate. Relevant electronic desk drops were distributed to all employees on National health days to create awareness on healthy living habits for the prevention of sickness and creation of emotionally balanced and engaged employees. The benefit of this is increased in productivity.

HIGHLIGHTS OVER THE PAST 5 YEARS:

NMISA made a significant contribution towards youth employment in the past five years and in total offered 74 bursaries to staff and externally (37). Six (6) graduates, three (3) Undergraduates, two (2) Postgraduate masters and one (1) Postgraduate Doctorate were absorbed into permanent positions in various NMISA metrology divisions after completion of their studies.

Over ninety (90) interns and Inservice Trainees were trained through the internship programme. Most of the interns went on to secure decent quality jobs after completion of their training, six (6) were absorbed into fulltime positions in various areas within NMISA whilst three (3) were offered bursaries to further their qualifications.

- **HR Priorities for the year under review**

  The Human Resources (HR) department has developed measures to increase core skills and staff capability, reduce staff turnover and ensure a fair and equitable work force.

- **Improve core skills and qualifications**

  Thirty-six employees have enrolled for further studies through the Human Capital Development (HCD) programme, they received financial support and time off for academic activities. Four employees completed their qualifications in the year under review.

- **Alignment of Organisational Design to strategic objectives**

  NMISA completed a process to review its organisational structure to ensure alignment to strategic goals and objectives. The (HR) department together with management will be focusing on the process of finalising the new organisational structure that supports its strategy.

- **Reduce Employee turnover**

  Staff retention remains a challenge for the organisation especially for support roles. Although salaries have improved with the implementation of a career ladder and pay progression system during the past three years, more efforts must be made to improve NMISA's overall employee offerings in terms of benefits and opportunities for career advancement.

D.2 Human Resource Oversight Statistics

D.2.1 Personnel cost by programme/activity/objective

Directorate/ Business Unit	Total expenditure for the entity (R'000)	Personnel expenditure (R'000)	Personnel Exp. as a % of total exp. (R'000)	Number of employees	Average personnel cost per employee (R'000)
Chief Executive Officer	3 621	10556	292%	9	1173
Finance and Corporate Services	205609	27 182	13%	36	755
Manufacturing Competitiveness and Redefinition of the SI	2 262	20 968	927%	29	723
Advanced Measurement Solutions and Energy Efficiency	2 075	21 526	1037%	30	718
Quality of Life	2 103	12 915	614%	10	1 292
Reference Materials, Green Economy and Commercial Services	9 588	21 914	229%	30	730
Research, International and Infrastructure Development	22 019	8 072	37%	7	1 153
Total	**247 277**	**123 133**	**50%**	**151**	**815**

D.2.1.1 Personnel Costs by salary band

Level	Personnel expenditure (R'000)	Personnel exp. as a % of total exp. (R'000)	Number of employees	Average personnel cost per employee (R'000)
Executive management	15 202	12%	8	1900
Middle management	29 181	24%	23	1269
Professional qualified	62 747	51%	89	705
Skilled	14 321	12%	25	573
Semi-skilled	1 682	1%	6	280
Total	123 133	**100%**	**151**	**815**

D.2.1.2 Performance Rewards

Programme/ activity/ objective	Performance rewards	Personnel expenditure (R'000)	% of Performance rewards to total personnel cost (R'000)
Executive management	1083	15 202	7%
Middle management	2746	29 181	9%
Professional qualified	6431	62 747	10%
Skilled	1175	14 321	8%
Semi-skilled	214	1 682	13%
Total	**11650**	**123 133**	**9%**

D.3.1.3 Training Costs

Programme/Business Unit	Personnel expenditure (R'000)	Training expenditure (R'000)	Training expenditure as a % of Personnel Cost)	Number of Employees trained	Average training cost per Employee
Chief Executive Officer	10 556	385	4%	9	43
Finance and Corporate Services	27 182	2979	11%	159	19
Manufacturing Competitiveness and Redefinition of the SI	20 968	428	2%	29	15
Advanced Measurement Solutions and Energy Efficiency	21 526	259	1%	29	9
Quality of Life	12 915	104	1%	11	9
Reference Materials, Green Economy and Commercial Services	21 914	529	2%	30	18
Research, International and Infrastructure Development	8 072	681	8%	6	114
Total	**123 133**	**5365**	**4%**	**273**	**226**

D.3.1.4 Employment and vacancies

Programme/Business Unit	2017/18 No. of Employees	2018/19 Approved posts	2018/19 No. of Employees	2018/19 Vacancies	Funded vacancies
Chief Executive Officer	10	12	9	3	1
Finance and Corporate Services	36	46	36	10	0
Manufacturing Competitiveness and Redefinition of the SI	27	35	29	6	2
Advanced Measurement Solutions and Energy Efficiency	29	38	30	8	2
Quality of Life	10	12	10	2	0
Reference Materials, Green Economy and Commercial Services	30	40	30	10	1
Research, International and Infrastructure Development	7	25	7	18	0
Total	**149**	**208**	**151**	**57**	**6**

D.3.1.5 Employment changes

Salary band	Employment at beginning of period	Appointments	Terminations	Promotions	Employment end of the period
Top management	8	0	0	0	8
Middle management	24	1	2	0	23
Professional qualified	87	7	5	0	89
Skilled	23	4	2	0	25
Semi-skilled	6	0	0	0	6
Total	**148**	**12**	**9**	**0**	**151**

D.3.1.6 Reasons for staff leaving

Reason	Number	% Of total number of staff leaving
Death	0	0
Resignation	9	100%
Dismissal	0	0
Retirement	0	0
Ill health	0	0
Expiry of contract	0	0
Total	**9**	**100%**

D.3.1.7 Labour Relations: Misconduct and disciplinary action

Nature of disciplinary Action	Number
Verbal Warning	2
Written warning	1
Final Written warning	1
Dismissal	0

D.3.1.8 Equity target and Employment Equity status

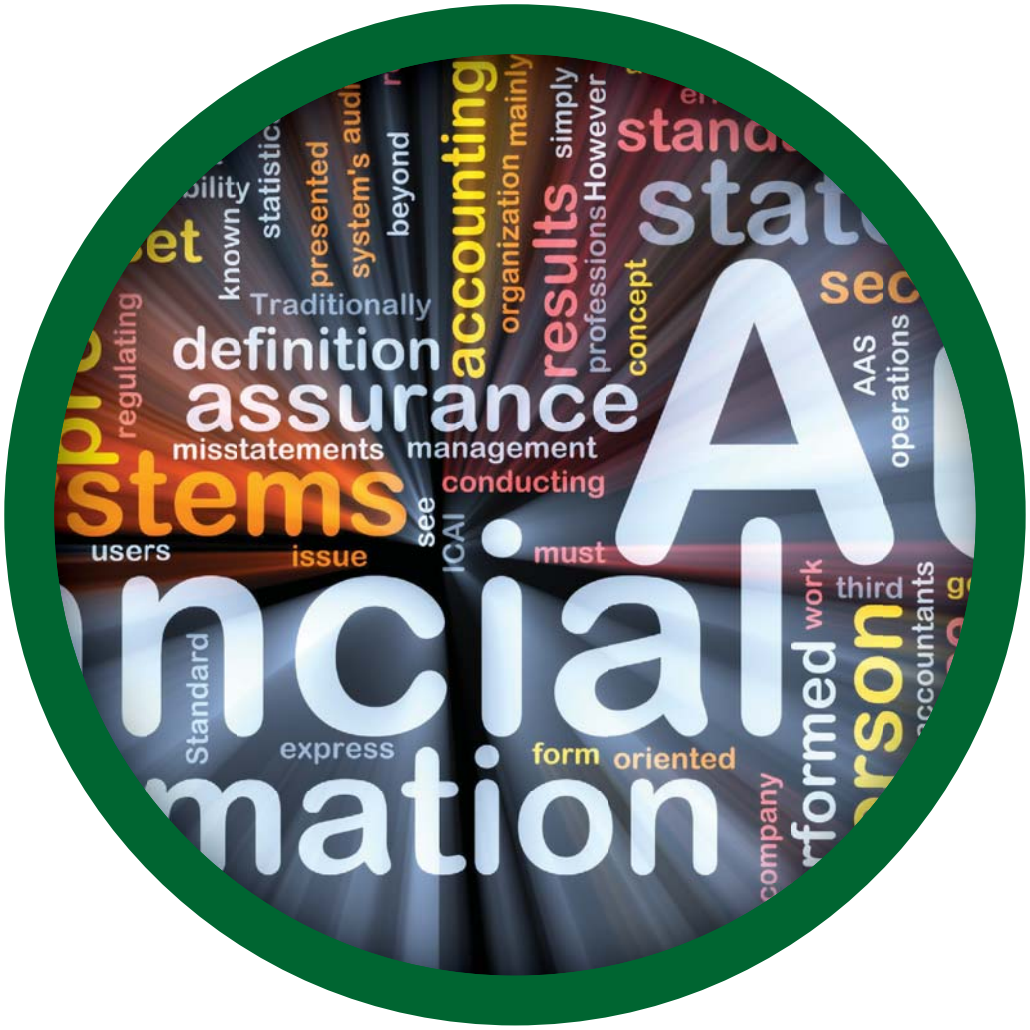
Levels	MALE									
	African		Coloured		Indian		White		Foreign Nationals	
	Current	Target	Current	Target	Current	Target	Current	Target	Current	Target
Top management	1	1	0	0	0	0	2	2	0	0
Senior management	0	0	0	0	0	0	0	0	0	0
Middle management	5	6	0	0	0	0	3	3	0	0
Professional qualified	17	17	2	2	0	0	15	15	1	1
Skilled	13	12	0	2	0	0	3	3	0	
Semi- skilled	0	0	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0	0	0
Total	**38**	**38**	**2**	**4**	**0**	**0**	**23**	**23**	**1**	**1**

D.3.1.9 Equity target and Employment Equity status (Continued)

Levels	FEMALE									
	African		Coloured		Indian		White		Foreign Nationals	
	Current	Target	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	3	3	0	0	0	0	2	2	0	0
Senior Management	0	0	0	0	0	0	0	0	0	0
Middle Management	8	7	0	0	2	2	4	4	0	0
Professional qualified	34	32	3	3	2	2	13	13	4	4
Skilled	8	8	0	1	0	0	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	**57**	**54**	**3**	**4**	**4**	**4**	**19**	**19**	**4**	**4**

D.3.1.10 Equity target and Employment Equity status (Continued)

Levels	Disabled Staff							
	African		Coloured		Indian		White	
	Current	Target	Current	Target	Current	Target	Current	Target
Top Management	0	0	0	0	0	0	0	0
Senior Management	0	0	0	0	0	0	0	0
Middle Management	0	0	0	0	0	0	0	0
Professionally qualified	1	0	0	0	0	0	0	0
Skilled	0	0	0	0	0	0	0	0
Semi-Skilled	0	0	0	0	0	0	0	0
Unskilled	0	0	0	0	0	0	0	0
Total	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**



PART E:

FINANCIAL INFORMATION

E.1 CFO's REPORT

E.1.1 Overview of Financial Performance

NMISA develops and maintains primary and secondary NMS for South Africa and establishes their comparability to the International System of Units (SI). These standards are disseminated to the South African industry through a range of products and services and in the case of a measurement dispute, reference analyses are provided to ensure conformity.

The main source of revenue for NMISA is the grant received from **the dti** For the past 4 years, NMISA has been motivating for an increase in baseline funding necessitated by the need to increase capacity to support National requirements, to realise the new SI and to establish the corresponding NMS, and in addition, infrastructure. NMISA did not receive the requested increase in baseline funding, but due to fiscus constraints, NMISA's allocation has been reduced resulting in a -2,5% average growth rate for the period 2015/16 to 2018/19. As evidenced in the chart below, there has been a decline in the transfers received from **the dti**. The decline has had a negative impact on the institute's growth and strategic direction. It has, however, necessitated the need for external revenue generation activities to enhance sustainability both in the short, medium, and long term.

The grant decreased from R264 million in 2017 to R232 million in 2019, the grant to be received in the outer years of the MTEF, whilst slightly increasing, will be lower in 2023 than it would have been before the reductions.

The spending focus was on maintenance and improvement of existing standards, development of new measurement standards, equipment and improvements of the facility infrastructure that supports the NMI as well as compensation and development of employees.

Figure 3: Grant transfers received

E.1.2 Revenue

NMISA has three main sources of revenue; transfer received from **the dti**, revenue from rendering of services and interest income. The transfer received of R232 million (2018: 253 million) represents 87% (2019: 89%) of total revenue.

The table below indicates revenue from all sources.

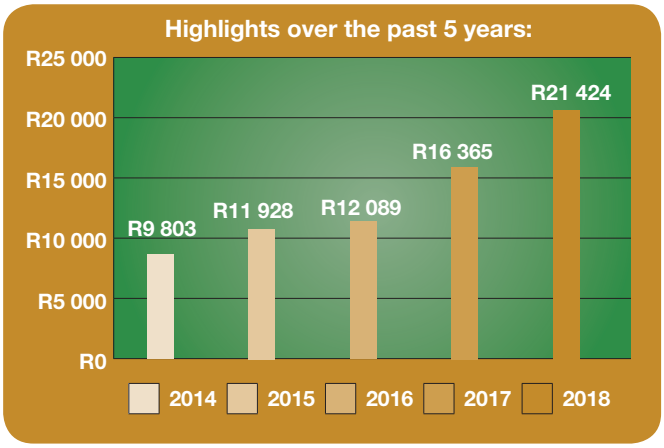
Sources of revenue	2019			2018		
	Budget	Actual amount	Over/under collection	Budget	Actual amount	Over/under collection
Transfer revenue	232 784 000	232 784 000	-	252 803 000	252 803 000	-
Rendering of services	31 560 781	21 424 280	10 136 501	20 010 000	16 365 433	3 644 567
Interest received	8 811 000	13 194 759	(4 383 759)	16 000 000	14 444 941	1 555 059
Other income	-	112 184	(112 184)	-	216 417	(216 417)
Donations received	-	-	-	-	472 802	(472 802)
	273 155 781	**267 515 223**	**5 640 558**	**288 813 000**	**284 302 593**	**4 510 407**

Given the projected decline in grant funding, NMISA initiated measures to increase externally generated revenue through the rendering of services. The institute was below its target of R31 million, however increased revenue generated by 31% to R21 million (2018: R16 million).

The chart below depicts the projected revenue growth from rendering of services over the MTEF period.

Figure 4: Revenue generated

It is expected that upon the enactment of compliance regulations by the relevant authorities, there will be a marked increase in the requirement for NMISA services by the industry at large. The streamlined strategic objectives towards the consolidation of all metrology services provided by the State under NMISA, thus reducing duplication and creating economies of scale, as well as being the primary service provider to the State for metrology services will further enhance the revenue generation potential for NMISA



The services on offer span from calibrations, material and characterisation, reference measurements/material, training/ consulting, and sponsorships.

The chart below depicts revenue per revenue source.

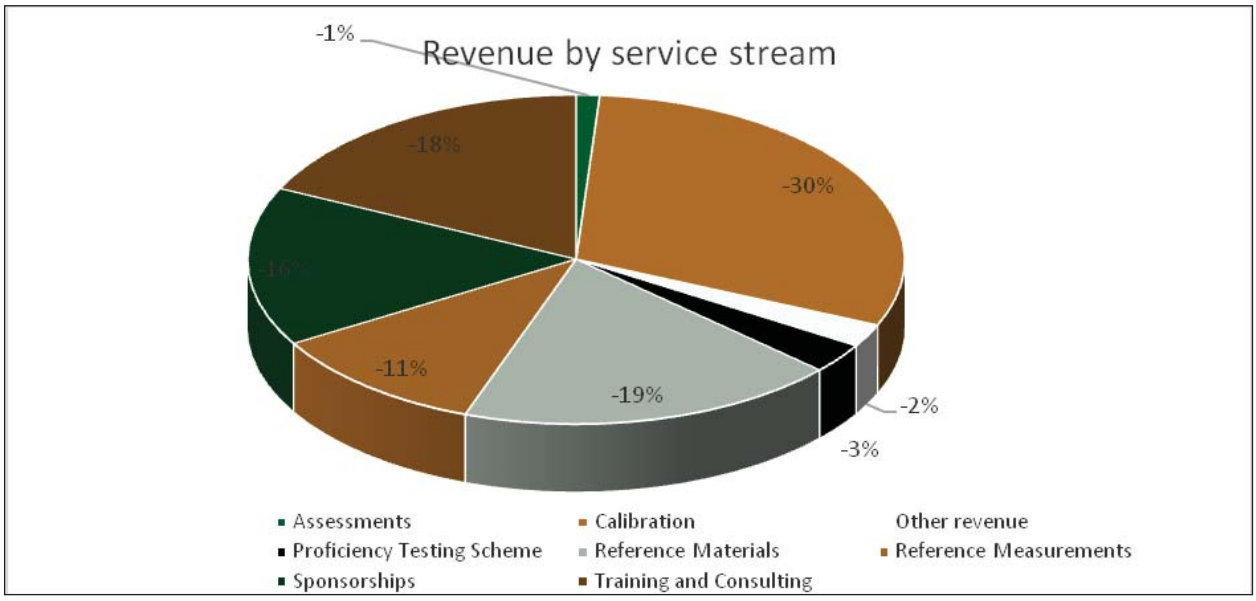


Figure 5: Revenue by Service Stream

NMISA also generated income from interest on investments of R13 million (2018: R14 million). The reduction in interest income is due to the utilisation of cash available to settle creditors and commitments delivered in the year under review.

E.1.3 Expenditure

The success of the modernisation of NMISA and shortening the traceability chain for Africa is dependent on a skilled, competent, transformed workforce and skills transfer of retiring scientists to the younger less experienced scientists. An undergraduate bursary and post-graduate studentship programmes are in place to drive the internal development of a pipeline of especially young African scientists/researchers who are assigned to specific projects with senior scientists/ researchers. In pursuing of these objectives, compensation of employees has increased to 45% (2018: 40%) as a percentage of total budget. This is due to the increased spending on HCD programmes, bursary schemes, increase performance bonuses and implementation of salary benchmarking processes. The strategy is aimed at not only maintaining but raising the qualification profile of the institute and increasing the employment equity profile to ensure that the institute is equipped to meet the evolving stringent measurement requirements both locally and International.

The increase in depreciation and amortisation is mainly due to the increased asset register leading to the resultant decrease in repairs and maintenance attributed to the replacement of aged/old equipment that have far extended their useful life. Other operatory expenditure amounted to R71 million (2018: R65 million) and is in line with budgeted expenditure.

E.1.3.1 Working Capital

The high cash balance is required for the payment of the reported commitments for goods and services that have yet to be delivered. Trade receivables have increased to R7 million from R6 million in 2018. This is as a result of increased revenue generated in the current financial year. Although the receivables equate to 32% of revenue generated, 83% of the receivables are due for less than 30 days. Only 2% (2018: 3%) of these have been impaired. The trade payables balances of R17 million (2018: R10 million) has increased, this is in line with the institute's resolve to follow up on commitments to ensure delivery takes place within the agreed upon timelines. The institute is currently in the process of further enhancing systems to ensure further improved compliance and accountability. Provisions have increased to R25 million from R22 million in 2018. This is mainly as a result of an inflationary increase in the provision for performance bonuses.

E.1.3.2 Capital Investment

In line with NMISA's strategic objectives, NMISA continues to embark on the ongoing process of recapitalising and modernisation of the NMI infrastructure through the replacement of aged and obsolete equipment. This has resulted in an increase in the book value of fixed assets from R128 million since 2014 to R445 million in the current financial year. The rate of capital equipment growth is expected to decline over the MTEF as capital expenditure is channelled towards the construction of a new campus.

NMISA has reached an infrastructure crossroad, it is at a point where small additional investments will not enable it to continue with services it is mandated to provide due to the aged infrastructure which has reached its technical limit of modifications. There is a significant funding gap between the funds required to build the new premises and the capital allocation from **the dti** as indicated in the MTEF. Relying solely on the current capital allocation from **the dti** would result in the project taking years to complete, thus negatively impacting NMISA's ability to successfully fulfil its mandate. Additional funding is needed to close the funding gap, thus ensuring that NMISA does not fall behind its peers with regards to technological and scientific developments to the detriment of the South African and Regional economy.

E.1.3.3 Commitments

NMISA procures equipment that is technically specialised, custom made or assembled to order according to specification, mostly from International manufacturers or NMIs. The delivery lead times for this equipment varies from 5 months to beyond 12 months. This has a resultant impact that funds are rolled over from year to year in the form of commitments. The commitments reported in the current financial year amount to R148 million (2018: R134 million) with 71% (2018: 80%) committed towards capital expenditure. Planning in terms of procurement is done well in advance to reduce the amount of commitments at the end of the financial year with a large number of tenders concluded in the second quarter of the financial year, in addition all approved orders are actively monitored with regards to delivery times.

E.1.3.4 Supply Chain Management overview

The SCM Unit is strategically positioned for service delivery to the institute through the procurement of NMS equipment, property and infrastructure, facilities management and general goods and services. The Unit is extending focus on logistics services to ensure effective management of movement of NMS equipment internally and for our clients in support of our calibration services. The unit will be further enhanced to accommodate the revised strategy on increased revenue, consolidation of metrology services as well as transfer of legal metrology to NMISA.

The institute did not incur any unauthorised or fruitless and wasteful expenditure in the year under review.

E.1.3.5 Financial Outlook

As a result of the expected additional reduction in grant funding from the fiscus, the financial sustainability of NMISA in the medium to long term will be impacted. The revenue sources of the institute need to cover all capital and operational costs on a year-to-year basis.

The institute is trading as a going concern and will continue to receive grant funding from **the dti** over the MTEF. **the dti** has confirmed R776 million, of which R412 million is allocated for capital expenditure towards the construction of a new NMISA campus, the frequency of this funding makes it impossible to adequately plan for this infrastructure. **the dti** has further confirmed that this CAPEX budget will be provided for the next 20 years towards this end. Given the size and funding requirements for the new campus, the institute will construct the campus in phases and is currently in negotiations for the procurement of land.

Given the difficult operating environment, NMISA has strategically focused to reposition itself on how all potential revenue sources can effectively be exploited. This fundamental switch to a commercially focused enterprise will take some time to implement in a manner that will be sustainable in the long-term. Steps have therefore been taken to enhance the revenue-generation capability of NMISA to support the operations, maintenance of new equipment purchased and ensure long-term sustainability remain on the cutting edge of measurement science and fulfil its mandate in support of industry and Government programmes.

Mr Calvin Sehlapelo CA (SA)
Chief Financial Officer
31 July 2019

E.2 Independent auditor's report to Parliament on the National Metrology Institute of South Africa

REPORT ON THE AUDIT OF THE FINANCIAL STATEMENTS

Opinion

1. We have audited the financial statements of the National Metrology Institute of South Africa set out on pages 66 to 98, which comprise the statement of financial position as at 31 March 2019, and the statement of financial performance, statement of changes in net assets, statement of cash flows and the statement of comparison of budget and actual amounts for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies.
2. 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 2019, and its financial performance and cash flows for the year then ended in accordance with South African Standards of Generally Recognised Accounting Practice (GRAP) and the requirements of the Public Finance Management Act of South Africa (PFMA).

Basis for opinion

3. We conducted our audit in accordance with the International Standards on Auditing (ISAs). Our responsibilities under those standards are further described in the auditor's responsibilities for the audit of the financial statements section of our report.
4. We are independent of the entity in accordance with section 290 and 291 of the Independent Regulatory Board for Auditors' Code of professional conduct for Registered Auditors (Revised January 2018), parts 1 and 3 of the Independent Regulatory Board for Auditors' Code of Professional Conduct for Registered Auditors (Revised November 2018) (together the IRBA Codes) and other independence requirements applicable to performing audits of financial statements in South Africa. We have fulfilled our other ethical responsibilities, as applicable, in accordance with the IRBA Codes and in accordance with other ethical requirements applicable to performing audits in South Africa. The IRBA Codes are consistent with the corresponding sections of the International Ethics Standards Board for Accountants' Code of Ethics for Professional Accountants and the International Ethics Standards Board for Accountants' International Code of Ethics for Professional Accountants (including International Independence Standards) respectively.
5. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of the accounting authority for the financial statements

6. The Board, which constitutes the accounting authority, is responsible for the preparation and fair presentation of the financial statements in accordance with the South African Standards of Generally Recognised Accounting Practice (GRAP) 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
7. In preparing the financial statements, the accounting authority is responsible for assessing the entity's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the accounting authority either intends to liquidate entity or to cease operations, or has no realistic alternative but to do so.

Auditor's responsibilities for the audit of the financial statements

8. Our objectives are to obtain reasonable assurance

about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with the ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

9. A further description of our responsibilities for the audit of the financial statements is included in Annexure A to the auditor's report.

REPORT ON THE AUDIT OF THE ANNUAL PERFORMANCE REPORT

Introduction and scope

10. In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) (PAA) and the general notice issued in terms thereof we have a responsibility to report material findings on the reported performance information against predetermined objectives for selected objectives presented in the annual performance report. We performed procedures to identify findings but not to gather evidence to express assurance.

11. Our procedures address the reported performance information which must be based on the approved performance planning documents of the entity. We have not evaluated the completeness and appropriateness of the performance indicators established and included in the planning documents. Our procedures also did not extend to any disclosures or assertions relating to planned performance strategies and information relating to future periods that may be included as part of the reported performance information. Accordingly our findings do not extend to these matters.

12. We evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected objectives presented in the annual performance report of the National Metrology Institute of South Africa for the year ended 31 March 2019.

Strategic oriented outcome	Strategic Objectives	Key performance Indicator	Pages in Annual Performance Report
Keep, maintain and develop the national measurement standards and provide for the use of the national measurement unit	Provide for the national measurement units by maintaining the SI units, units outside the SI and equivalents of units.	Gazette National Measurement Units	38
	Maintain the Schedule of National Measurement Standards	Number of national measurement standards maintained submitted to the dti to Gazette	38
	Keep, maintain and develop measurement systems for bringing national measurement standards and reference methods into being.	Number of improved NMS, secondary standards, reference materials and methods	38
To ensure that the South African measurement system is internationally comparable, by participating in the activities of the International Committee for Weights and Measures as per the Mutual Recognition Arrangement (CIPM MRA)	To ensure internationally recognised and comparable national measurement standards and units by participating in the Metre Convention, CIPM MRA and AFRIMETS activities	Number of memberships of international committee for weights and measures CIPM and Consultative Committees (CC)	38
	Establish confidence in the accuracy of the national measurement standards by suitable and documented quality and management system	Number of accredited laboratories accredited to ISO 17025 ,ISO 17034,ISO 17043 and/ or peer reviewed quality system	38
	To maintain the calibration and measurement capability (CMC) claims in KCDB as evidence of South Africa's measurement capability	Number of CMCs as published in the Key Comparison Database (KCDB)	38

Strategic oriented outcome	Strategic Objectives	Key performance Indicator	Pages in Annual Performance Report
Provide measurement knowledge and expertise as a key component of the Technical Infrastructure with regard to public policy objectives measurement compliance issues in terms of health, safety and the environment	As the foundation of the South African measurement system, provide technical measurement expertise and support for public policy objectives, accreditation, standardisation and regulatory affairs	Number of Refereed and/or peer-reviewed publications	38
		Number of articles, applications, conference proceedings or technical notes published	39
Provide an integrated human capital development programme for metrology	To maintain and ensure continued expertise, and establish the necessary skills according to internationally acceptable standards.	Number of interns and in-service trainees hosted.	39
		Percentage of filled funded vacancies	
Provide essential support to South African public and private enterprises through dissemination of the national measurement standards, units and expertise	Disseminate traceability, measurement expertise and services to South African public and private enterprises by means of calibration, measurement or analysis, certified reference materials	Income generated from dissemination activities	39
		Percentage customer satisfaction	39
	Provide appropriate technology and skills transfer to the South African industry, especially to SMEs	Number of industry and/ or regional metrologists trained in accurate measurement	40
		Number of courses presented to industry	40
Adhere to the regulatory requirements of a type 3A public entity and sound corporate governance	Financial systems to ensure compliance with regulatory frameworks	Actual expenditure to budget	40

13. We performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. We performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.

Other matter

14. Although we identified 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

15. Refer to the annual performance report on pages 38 to 40 for information on the achievement of planned targets for the year and explanations provided for the under/overachievement of targets.

REPORT ON THE AUDIT OF COMPLIANCE WITH LEGISLATION

Introduction and scope

16. In accordance with the PAA and the general notice issued in terms thereof we have a responsibility to report material findings on the compliance of the entity with specific matters in key legislation. We performed procedures to identify findings but not to gather evidence to express assurance.

17. We did not raise material findings on compliance with the specific matters in key legislation set out in the general notice issued in terms of the PAA.

OTHER INFORMATION

18. The National Metrology Institute of South Africa's accounting authority is responsible for the other information. The other information comprises the information included in the annual report which includes the reports by the accounting authority and the audit committee's report. The other information does not include the financial statements, the auditor's report thereon and those selected objectives presented in the annual performance report that have been specifically reported on in the auditor's report.

19. Our opinion the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and we do not express an audit opinion or any form of assurance conclusion thereon.

20. In connection with our audit, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected objectives presented in the annual performance report, or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

21. If, based on the work we have performed, on the other information obtained prior to the date of this auditor's report, we conclude that there is a material misstatement of this other information, we are required to report that fact.

Internal control deficiencies

22. We considered internal control relevant to our audit of the financial statements, annual performance report and compliance with legislation, however the objective is not to express any form of assurance thereon. We did not identify any significant deficiencies in internal control.

Auditor tenure

23. In terms of the IRBA rule published in Government Gazette Number 39475 dated 4 December 2015, we report that Nexia SAB& T has been the auditor of the National Metrology Institute of South Africa for 3 years.

Nexia SAB&T

Nexia SAB& T
Per: Philemon Mawire
Director
Chartered Accountant
Registered Auditor
31 July 2019

ANNEXURE A – AUDITOR'S RESPONSIBILITY FOR THE AUDIT

1. As part of an audit in accordance with the ISAs, we exercise professional judgement and maintain professional scepticism throughout our audit of the financial statements, and the procedures performed on reported performance information for selected objectives and on the entity's compliance with respect to the selected subject matters.

Financial statements

2. In addition to our responsibility for the audit of the financial statements as described in the auditor's report, we also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.

- Obtain an understanding of internal control relevant to the audit 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.

- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the accounting authority.

- Conclude on the appropriateness of the accounting authority's use of the going concern basis of accounting in the preparation of the financial statements. We also conclude, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the National Metrology Institute of South Africa's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify the opinion on the financial statements. Our conclusions are based on the information available to me at the date of the auditor's report. However, future events or conditions may cause an entity to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Reported performance information

3. In addition to our responsibility for the assurance engagement on reported performance information as described in the auditor's report, we also:

- Identify and assess risks of material misstatement of the reported performance information, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. In making those risk assessments we consider internal control relevant to the management and reporting of performance information per selected objective 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.

- Evaluate the documentation maintained by the entity that supports the generation, collation, aggregation, monitoring and reporting of performance indicators and their related targets for the selected objectives.

- Evaluate and test the usefulness of planned and reported performance information, including presentation in the annual performance report, its consistency with the approved performance planning documents of the entity and whether indicators and related targets were measurable and relevant.

- Evaluate and test the reliability of information on performance achievement to determine whether it is valid, accurate and complete.

Quality control relating to assurance engagements

4. In accordance with International Standards on Quality Control 1, we maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements and professional standards.

Communication with those charged with governance

5. We communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

6. We also confirm to the accounting authority that we have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on our independence, and where applicable, related safeguards.

E.3 Statement of Financial Position
as at 31 March 2019

Figures in Rand	Note(s)	2019	2018
Assets			
Current Assets			
Receivables from exchange transactions	7	6 943 302	6 066 057
Inventories	8	5 062 282	172 270
Pre-payments	28	10 885 044	15 444 445
Cash and cash equivalents	9	180 471 420	189 882 018
		203 362 048	**211 564 790**
Non-Current Assets			
Property, plant and equipment	3	442 146 599	403 923 782
Intangible assets	4	2 998 906	2 239 225
Pre-payments	28	169 976	710 133
Rental deposit	24	605 419	605 419
		445 920 900	**407 478 559**
		649 282 948	**619 043 349**
Liabilities			
Current Liabilities			
Payables from exchange transactions	10	17 424 222	10 144 188
Provisions	29	25 717 425	22 834 100
Income received in advance	6	323 125	484 374
Total Liabilities		**43 464 772**	**33 462 662**
Net Assets		**605 818 176**	**585 580 687**
Accumulated surplus		**605 818 176**	**585 580 687**

E.4 Statement of Financial Performance
for the Year Ended 31 March 2019

Figures in Rand	Note(s)	2019	2018
Revenue			
Revenue from exchange transactions			
Rendering of services		21 424 280	16 365 433
Other income		112 184	72 742
Interest received		13 194 759	14 444 941
Total Revenue from exchange		**34 731 223**	**30 883 116**
Revenue from non-exchange transactions			
Transfer revenue			
Transfer from controlling entity		232 784 000	252 803 000
Donations received		-	472 802
Total revenue from non-exchange transactions		**232 784 000**	**253 275 802**
Total revenue	11	**267 515 223**	**284 158 918**
Expenditure			
Employee related expenses	13	(123 693 155)	(114 553 582)
Depreciation and amortisation	3 & 4	(43 220 376)	(34 718 620)
Impairment loss	3	(155 051)	-
Credit losses	14	9 866	(137 697)
Contracted services		(140 281)	(138 904)
Repairs and maintenance	3	(8 175 928)	(9 784 337)
Operating expenses	12	(70 055 743)	(64 892 128)
Total expenditure		**(245 430 668)**	**(224 225 268)**
(Loss)/profit on disposal of assets		(1 240 780)	143 675
Foreign exchange loss		(606 286)	(58 431)
		(1 847 066)	**85 244**
Surplus for the year		**20 237 489**	**60 018 894**

E.5 Statement of Changes in Net Assets

for the Year Ended 31 March 2019

Figures in Rand	Accumulated surplus 2018
Restated balance as at 31 March 2017	**525 561 793**
Surplus for the year	60 018 894
Balance as at 31 March 2018	**585 580 687**
Surplus for the year	20 237 489
Balance as at 31 March 2019	**605 818 176**

E.6 Cash Flow Statement
for the Year Ended 31 March 2019

Figures in Rand	Note(s)	2019	2018
Cash flows from operating activities			
Receipts			
Rendering of services		20 247 148	12 697 059
Transfer from controlling entity		232 784 000	252 803 000
Interest received		13 194 759	14 444 941
Other income		112 184	545 544
		266 338 091	**280 490 544**
Payments			
Employee related expenses		(121 636 264)	(106 779 913)
Suppliers		(70 513 720)	(86 897 568)
		(192 149 984)	**(193 677 481)**
Net cash flows from operating activities	15	**74 188 107**	**86 813 063**
Cash flows from investing activities			
Purchase of property, plant and equipment	3	(80 864 872)	(95 229 608)
Proceeds from sale of property, plant and equipment		13 171	674 445
Purchase of intangible assets	4	(2 747 004)	(1 094 697)
Net cash flows from investing activities		**(83 598 705)**	**(95 649 860)**
Net decrease in cash and cash equivalents		**(9 410 598)**	**(8 836 797)**
Cash and cash equivalents at the beginning of the year		189 882 018	198 718 815
Cash and cash equivalents at the end of the year	**9**	**180 471 420**	**189 882 018**

E.7 Statement of Comparison of Budget and Actual Amounts

Budget on Modified Cash Basis

Figures in rands	Final Budget	Actual amounts	% Variance between budget and actual	Reference
Statement of Financial Performance				
Revenue				
Revenue from exchange transactions				
Rendering of services	31 560 781		32%	27.1
Other income	-	112 184		27.5
Interest received	8 811 000	13 194 759	-50%	27.2
Total revenue from exchange transactions	**40 371 781**	**34 731 223**		
Revenue from non-exchange transactions				
Transfer revenue				
Transfer from controlling entity	232 784 000	232 784 000		
Total revenue	**273 155 781**	**267 515 223**		
Expenditure				
Employee related expenses	(123 912 502)	(123 693 155)	0%	
Depreciation and amortisation	-	(43 220 376)		27.5
Impairment loss	-	(155 051)		27.5
Credit losses	-	9 866		27.5
Repairs and maintenance	(8 038 708)	(8 175 928)	-2%	
Contracted services	(250 000)	(140 281)	44%	
Foreign exchange loss	(110 000)	(606 286)	451%	27.3
Loss on disposal of assets	-	(1 240 780)		27.4
Operating expenses	(72 487 071)	(70 055 743)	3%	27.5
Total expenditure	**(204 798 281)**	**(247 277 734)**		
Capital expenditure	(68 357 500)	(83 611 876)	-22%	
Surplus	**-**	**(63 374 387)**		27.6
Reconciliation: Format and classification differences				
Cash flow from investing activities				
Property, plant and equipment	80 864 872			
Intangible assets		2 747 004		
Surplus in the Statement of Financial Performance		**20 237 489**		

E.8 Accounting Policies

E.8.1 Basis of preparation

The AFS 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, No. 1 of 1999 (PFMA), as amended.

These AFS 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.

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 are consistent with the prior year, are disclosed below.

E.8.1.2 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 reporting 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 or fair value 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.

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

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

The useful lives of items of property, plant and equipment were assessed as follows:

Item	Useful life in years
Plant and equipment	7 to 20
Furniture and fixtures	7
Motor vehicles	7 to 10
Office equipment	5
Leasehold improvements	<Lease period/useful life

The cost of leasehold improvements is depreciated over the shorter of the lease period or the useful life.

When significant components of an item of property, plant and equipment have different useful lives they will be accounted for as separate items in the asset register and disclosed in the same category to the main asset. These components are depreciated separately.

E.8 Accounting Policies (continued)

The residual value, the useful life and depreciation method of each asset are reviewed at the end of each reporting date. If the expectation differs from previous estimates, the change is accounted for as a change in accounting estimate. Refer to note 5.

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.

Parts of some items of property, plant and equipment may require replacement at regular intervals, the cost of replacing parts of such items is capitalised if the recognition criteria is met. The carrying amount of those parts that are replaced is derecognised in accordance with the derecognition provisions.

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 loss arising from the 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 the 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.

The entity separately discloses expenditure to repair and maintain property, plant and equipment in the notes to the financial statements Refer to note 3..

E.8.1.3 Intangible assets

An intangible asset is an identifiable non-monetary asset without physical substance.

An asset is identifiable if it either:

- Is separable, i.e. is capable of being separated or divided from an entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable assets or liability, regardless of whether the entity intends to do so or
- Arises from binding arrangements (including rights from contracts), regardless of whether those rights are transferable or separable 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.

Intangible assets is carried at its cost less any accumulated amortisation and any accumulated impairment losses.

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

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

E.8 Accounting Policies (continued)

Amortisation is provided to write down the intangible assets, on a straight line basis, to their residual values as follows:

Item	Useful life
Computer software	2

Items of intangible assets are derecognised 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.

E.8.1.4 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.

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

Financial assets and liabilities are measured at amortised cost after initial recognition.

E.8.1.5 Financial assets

NMISA's principal 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 on call with banks and are classified as financial assets at amortised cost.

Impairment and uncollectability

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.

E.8 Accounting Policies (continued)

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 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.

The entity derecognises a financial asset 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.

E.8.1.6 Financial liabilities

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

Trade and other payables

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

Derecognition

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

E.8.1.7 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 both land and buildings 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.

E.8 Accounting Policies (continued)

E.8.1.8 Inventories

Inventories are initially measured at cost except where inventories are acquired through a non-exchange transaction, then their costs are their fair value as at the date of acquisition.

Subsequently inventories are measured at the lower of cost and net realisable value.

Inventories are measured at the lower of cost and current replacement cost where they are held for:

- Distribution at no charge or for a nominal charge or
- Consumption in the production process of goods to be distributed at no charge or for a nominal charge.

Net realisable value is the estimated selling price in the ordinary course of operations less the estimated costs of completion and the estimated costs necessary to make the sale, exchange or distribution.

Current replacement cost is the cost the entity incurs to acquire the asset on the reporting date.

The cost of inventories is assigned using the weighted average cost formula. The same cost formula is used for all inventories having a similar nature and use to the entity.

When inventories are sold, the carrying amounts of those inventories are recognised as an expense in the period in which the related revenue is recognised. If there is no related revenue, the expenses are recognised when the goods are distributed, or related services are rendered. The amount of any write-down of inventories to net realisable value or current replacement cost and all losses of inventories are recognised as an expense in the period the write-down or loss occurs.

The amount of any reversal of any write-down of inventories, arising from an increase in net realisable value or current replacement cost, are recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

E.8.1.9 Provisions and contingencies

Provisions

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.

E.8 Accounting Policies (continued)

Contingent liabilities

Contingent liabilities are recorded in the notes to the financial statements when there is a possible obligation that arises from past events, and whose existence will be confirmed only by the occurrence or non-occurrence of one or more uncertain future events not within the control of NMISA or when there is a present obligation that is not recognised because it is not probable that an outflow of resources will be required to settle the obligation or the amount of the obligation cannot be measured reliably.

E.8.1.10 Commitments

Commitments are recorded at cost in the notes to the financial statements when there is a contractual arrangement or an approval by management in a manner that raises a valid expectation that NMISA will discharge its responsibilities thereby incurring future expenditure that will result in the outflow of cash.

E.8.1.11 Revenue from exchange transactions

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

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 associated with the transaction will flow to NMISA,
- 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.

Revenue is measured at the fair value of the consideration received or receivable.

Interest

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

E.8.1.12 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.

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 dti.**

E.8.1.13 Foreign currency translation

A foreign currency transaction is recorded, on initial recognition in the functional currency, by applying to the foreign currency amount the spot exchange rate between the functional currency and the foreign currency at the date of the transaction.

E.8 Accounting Policies (continued)

At each reporting date:

- Foreign currency monetary items are translated using the closing rate and
- non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the date of the transaction.

E.8.1.14 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.

E.8.1.15 Fruitless and wasteful expenditure

Fruitless and wasteful expenditure as defined by Section 1 of the PFMA means expenditure which was made in vain and would have been avoided had reasonable care been exercised.

Fruitless and wasteful expenditure is recorded in the notes to the financial statements when confirmed. The amount recorded is equal to the total value of the fruitless and wasteful expenditure incurred. The expenditure is removed from the notes to the financial statements when it is resolved or transferred to receivables for recovery.

Fruitless and wasteful expenditure receivables are measured at the amount that is expected to be recoverable and are derecognised when settled or subsequently written-off as irrecoverable.

E.8.1.16 Irregular expenditure

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

(a) The PFMA,

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

(c) Any Provincial Legislation providing for procurement procedures in that Provincial Government.

Irregular expenditure is recorded in the notes to the financial statements when confirmed. The amount recorded is equal to the value of the irregular expenditure incurred unless it is impracticable to determine, in which case reasons therefore are provided in the note.

Irregular expenditure is removed from the note when it is either condoned by the relevant authority, transferred to receivables for recovery or not condoned and is not recoverable.

Irregular expenditure receivables are measured at the amount that is expected to be recoverable and are de-recognised when settled or subsequently written-off as irrecoverable.

E.8.1.17 Budget information

Budgets are prepared on a modified cash basis over the 12-month period of the financial year.

A comparison with the budgeted amounts for the current reporting period have been included in the statement of comparison of budget and actual amounts. The reasons for significant variances are disclosed in the notes to the AFS.

E.8 Accounting Policies (continued)

E.8.1.18 Related party disclosures

A related party is a person or an entity with the ability to control or jointly control the other party, or exercise significant influence over the other party, or vice versa, or an entity that is subject to common control, or joint control.

Control is the power to govern the financial and operating policies of an entity so as to obtain benefits from its activities.

Joint control is the agreed sharing of control over an activity by a binding arrangement, and exists only when the strategic financial and operating decisions relating to the activity require the unanimous consent of the parties sharing control (the ventures).

Related party transaction is a transfer of resources, services or obligations between the reporting entity and a related party, regardless of whether a price is charged.

Significant influence is the power to participate in the financial and operating policy decisions of an entity, but is not control over those policies.

Management are those persons responsible for planning, directing and controlling the activities of the entity, including those charged with the governance of the entity in accordance with legislation, in instances where they are required to perform such functions.

Close members of the family of a person are considered to be those family members who may be expected to influence, or be influenced by, that management in their dealings with the entity.

All other entities in the National Sphere of Government are considered to be related but have not been disclosed unless transactions with those entities took place on terms that were not on ordinary terms or not in the ordinary course of business.

E.8.1.19 Events after reporting date

Events after reporting date are those events, both favourable and unfavourable, that occur between the reporting date and the date when the financial statements are authorised for issue. Two types of events can be identified:

- Those that provide evidence of conditions that existed at the reporting date (adjusting events after the reporting date) and
- Those that are indicative of conditions that arose after the reporting date (non-adjusting events after the reporting date).

The entity will adjust the amount recognised in the financial statements to reflect adjusting events after the reporting date once the event occurred.

The entity will disclose the nature of the event and an estimate of its financial effect or a statement that such estimate cannot be made in respect of all material non-adjusting events, where non-disclosure could influence the economic decisions of users taken on the basis of the financial statements.

E.8.1.20 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

E.8 Accounting Policies (continued)

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 in surplus or deficit.

E.8.1.21 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 or
- 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.

E.8.1.22 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.

E.8 Accounting Policies (continued)

E.8.1.23 Significant judgements and sources of estimation uncertainty

In preparing the AFS, management is required to make estimates and assumptions that affect the amounts presented in the AFS 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 AFS.

Significant judgements include: provision for doubtful debts, useful life, residual value and impairment of assets.

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.

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 3 to 5. An annual assessment and review of estimated useful lives and residual values is performed, and any significant change is accounted for as a change in accounting estimate in accordance with GRAP 3.

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.

E.9 Notes to the Financial Statements

E.9.1 New standards and interpretations

E.9.1.1 Standards and interpretations approved but not yet effective in the current year

The following standards and interpretations were approved but not yet effective, in the current financial year.

GRAP 20: Related party disclosures

The objective of this standard is to ensure that a reporting entity's financial statements contain the disclosures necessary to draw attention to the possibility that its financial position and surplus or deficit may have been affected by the existence of related parties and by transactions and outstanding balances with such parties.

This standard requires disclosure of related party relationships, transactions and outstanding balances, including commitments, in the financial statements of the reporting entity. The effective date of the standard is 01 April 2019.

NMISA has partially adopted the standard, disclosure of related party relationships, transactions and balances is made in note 16 and 17 of the AFS.

GRAP 32: Service concession arrangement: 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. This 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. The effective date of the standard is 01 April 2019.

NMISA currently has no service concession arrangements, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 108: Statutory receivables

The objective of this standard is to prescribe accounting requirements for the recognition, measurement, presentation and disclosure of statutory receivables. The effective date of the standard is 01 April 2019.

NMISA currently has no receivables arising from legislative requirements, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

IGRAP 17: Service concession arrangement where a grantor controls a significant residual interest in an asset

This Interpretation of the standards of GRAP provides guidance to the grantor where it has entered into a service concession arrangement, but only controls, through ownership, beneficial entitlement or otherwise, a significant residual interest in a service concession asset at the end of the arrangement, where the arrangement does not constitute a lease. This Interpretation of the standards of GRAP shall not be applied by analogy to other types of transactions or arrangements.

A consensus is reached, in this Interpretation of the standards of GRAP, on the recognition of the performance obligation and the right to receive a significant interest in a service concession asset. The effective date of the standard is 01 April 2019.

NMISA currently has no service concession arrangements, it is therefore unlikely that the interpretation will have a material impact on the entity's AFS.

E.9 Notes to the Financial Statements (continued)

GRAP 109: Accounting by principals and agents

The objective of this standard is to outline principles to be used by an entity to assess whether it is party to a principal agent arrangement, and whether it is a principal or an agent in undertaking transactions in terms of such an arrangement. The standard does not introduce new recognition or measurement requirements for revenue, expenses, assets and/or liabilities that result from principal-agent arrangements.

The standard does however provide guidance on whether revenue, expenses, assets and/or liabilities should be recognised by an agent or a principal, as well as prescribe what information should be disclosed when an entity is a principal or an agent. The effective date of the standard is 01 April 2019.

NMISA currently has no principal-agent arrangements, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 34: Separate financial statements

The objective of this standard is to prescribe the accounting and disclosure requirements for investments in controlled entities, joint ventures and associates when an entity prepares separate financial statements. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no investments in controlled entities, joint ventures and associates, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 35: Consolidated financial statements

The objective of this standard is to establish principles for the presentation and preparation of consolidated financial statements when an entity controls one or more other entities. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no subsidiaries or control over any entities, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 36: investments in associates and joint venture

The objective of this standard is to prescribe the accounting for investments in associates and joint ventures and to set out the requirements for the application of the equity method when accounting for investments in associates and joint ventures.

This standard shall be applied by all entities that are investors with significant influence over, or joint control of, an investee where the investment leads to the holding of a quantifiable ownership interest. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no investments in associates and joint ventures, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 37: Joint arrangements

The objective of this standard is to establish principles for financial reporting by entities that have an interest in arrangements that are controlled jointly (i.e. joint arrangements). This standard shall be applied by all entities that are a party to a joint arrangement. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no joint arrangements, it is therefore unlikely that the standard will have a material impact on the entity's annual financial statement.

E.9 Notes to the Financial Statements (continued)

GRAP 38: Disclosure of interest in other entities

The objective of this standard is to require an entity to disclose information that enables users of its financial statements to evaluate the nature of, and risks associated with, its interests in controlled entities, unconsolidated controlled entities, joint arrangements and associates, and structured entities that are not consolidated; and the effects of those interests on its financial position, financial performance and cash flows. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no interest in other entities, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

GRAP 110: Living and non-living resources

The objective of this standard is to prescribe the recognition, measurement, presentation and disclosure requirements for living resources; and disclosure requirements for non-living resources. The effective date of the standard is not yet set by the Minister of Finance.

NMISA currently has no living and non-living resources, it is therefore unlikely that the standard will have a material impact on the entity's AFS.

IGRAP 18: Interpretation of the standard of GRAP on recognition and derecognition of land

This Interpretation provides guidance on when an entity should recognise and derecognise land as an asset in its financial statements. The interpretation applies to the initial recognition and derecognition of land in an entity's financial statements. It also considers joint control of land by more than one entity. The effective date of the interpretation is 01 April 2019.

NMISA is planning to buy land in the near future, and this interpretation will have an impact on the entity's AFS in the future.

IGRAP 19: Liabilities to pay levies

This Interpretation addresses the recognition of a liability to pay a levy if that liability is within the scope of GRAP 19. It also addresses the recognition of a liability to pay a levy whose timing and amount is certain. The effective date of the interpretation is 01 April 2019.

The entity has no current or future obligation to pay a levy, it is therefore unlikely that the interpretation will have a material impact on the entity's AFS.

IGRAP 20: Accounting for adjustments to revenue

Adjustments to revenue already recognised in terms of legislation or similar means arise from the completion of an internal review process within the entity, and/or the outcome of an external appeal or objection process undertaken in terms of legislation or similar means. Adjustments to revenue include any refunds that become payable as a result of the completion of a review, appeal or objection process.

The adjustments to revenue already recognised following the outcome of a review, appeal or objection process can either result in a change in an accounting estimate, or a correction of an error.

This Interpretation clarifies the accounting for adjustments to exchange and non- exchange revenue charged in terms of legislation or similar means; and interest and penalties that arise from revenue already recognised as a result of the completion of a review, appeal or objection process. The effective date of the interpretation is for years beginning on or after 01 April 2020.

E.9 Notes to the Financial Statements (continued)

E.9.2 Property, plant and equipment

	2019			2018		
	Cost / Valuation	Accumulated depreciation and accumulated impairment	Carrying value	Cost / Valuation	Accumulated depreciation and accumulated impairment	Carrying value
Plant and equipment	564 676 545	(130 154 071)	434 522 474	492 351 402	(100 660 172)	391 691 230
Furniture and fixtures	4 009 213	(3 201 851)	807 362	5 736 309	(3 603 015)	2 133 294
Motor vehicles	394 792	(153 531)	241 261	394 792	(107 264)	287 528
Office equipment	15 270 776	(9 190 274)	6 080 503	13 827 528	(7 722 955)	6 104 573
Leasehold improvements	10 863 681	(10 368 681)	494 999	8 484 593	(4 777 436)	3 707 157
Total	**595 215 007**	**(153 068 408)**	**442 146 599**	**520 794 624**	**(116 870 842)**	**403 923 782**

Reconciliation of property, plant and equipment - 2019	Opening balance	Additions	Disposals	Depreciation	Net impairment loss	Total
Plant and equipment	391 691 230	75 469 402	(599 987)	(31 883 120)	(155 051)	434 522 474
Furniture and fixtures	2 133 294	421 133	(452 272)	(1 294 793)	-	807 362
Motor vehicles	287 528	-	-	(46 267)	-	241 261
Office equipment	6 104 573	2 566 098	(200 604)	(2 389 564)	-	6 080 503
Leasehold improvements	3 707 157	2 408 239	(1 089)	(5 619 308)	-	494 999
	403 923 782	**80 864 872**	**(1 253 952)**	**(41 233 052)**	**(155 051)**	**442 146 599**

Reconciliation of property, plant and equipment - 2018	Opening balance	Additions	Disposals	Depreciation	Total
Plant and equipment	328 807 161	90 718 754	(533 160)	(27 301 525)	391 691 230
Furniture and fixtures	2 189 511	428 577	(10 369)	(474 425)	2 133 294
Motor vehicles	120 285	201 823	-	(34 580)	287 528
Office equipment	6 568 885	1 584 985	(16 940)	(2 032 357)	6 104 573
Leasehold improvements	4 257 722	2 295 469	-	(2 846 034)	3 707 157
	341 943 564	**95 229 608**	**(560 469)**	**(32 688 921)**	**403 923 782**

Expenditure incurred to repair and maintain property, plant and equipment included in Statement of Financial Performance

E.9 Notes to the Financial Statements (continued)

Repairs and maintenance	8 175 928	9 784 337

E.9.3 Intangible assets

	2019			2018		
	Cost / Valuation	Accumulated depreciation and accumulated impairment	Carrying value	Cost / Valuation	Accumulated depreciation and accumulated impairment	Carrying value
Computer software	9 701 531	(6 702 625)	2 998 906	6 954 528	(4 715 303)	2 239 225

Reconciliation of intangible assets - 2019

	Opening balance	Additions	Amortisation	Total
Computer software	**2 239 225**	**2 747 004**	**(1 987 323)**	**2 998 906**

Reconciliation of intangible assets - 2018

	Opening balance	Additions	Amortisation	Total
Computer software	**3 174 227**	**1 094 697**	**(2 029 699)**	**2 239 225**

E.9.4 Change in estimate

The entity has reassessed the useful lives of property, plant and equipment and intangible assets, which resulted in certain assets' remaining useful lives to change by an average of 2 years. The effect of the change in accounting estimate has resulted in a decrease in depreciation amounting to R 2 938 538 for the current period.

Change in depreciation and amortisation resulting from reassessment of useful lives. The following categories are affected:

	Values derived using amended estimate	Value derived from using original estimate	Value impact of change in estimate
Furniture and fixtures	1 294 793	1 315 568	(20 775)
Intangible assets	1 987 323	2 695 940	(708 617)
Leasehold improvements	5 619 308	5 619 308	-
Office equipment	2 389 564	2 914 926	(525 362)
Plant and equipment	31 883 120	33 563 858	(1 680 738)
Motor vehicles	46 267	49 313	(3 046)
	43 220 375	**46 158 913**	**(2 938 538)**

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.5 Income received in advance

Pre-payments received from customers	323 125	484 374

E.9.6 Receivables from exchange transactions

Trade receivables	7 073 812	6 073 539
Employee advances and other receivables	38 390	186 896
Less: Provision for impairment of trade receivables	(168 900)	(194 378)
	6 943 302	6 066 057

NMISA does not hold any collateral as security. The impairment of trade receivables was determined with reference to probability of collection of the amounts. Refer to note 19.

Movement in the provision for impairment of trade receivables

Opening balance	194 378	56 681
Provision for impairment	168 900	194 378
Amounts written off as uncollectible	(15 612)	-
Unused amounts reversed	(178 766)	(56 681)
	168 900	**194 378**

E.9.7 Inventories

Raw materials	3 782 040	81 654
Finished goods	1 280 242	90 616
	5 062 282	**172 270**
Inventories recognised as an expense during the year, included under operating expenses	86 213	197 134
Inventories written-down during the year, included under operating expenses	86 081	-
Inventory is carried at lower of cost or net realisable value.		

E.9.8 Cash and cash equivalents

Cash and cash equivalents consist of:

Cash on hand	19 444	4 550
Bank balances	5 245 043	2 865 294
Short-term deposits*	175 206 933	187 012 174
	180 471 420	**189 882 018**

There are no restrictions on cash held with banks. Cash and cash equivalents (other than cash on hand) are held with Standard Bank, which is rated AA based on rating agency Fitch Ratings.

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

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.9 Payables from exchange transactions

Trade payables	7 523 683	5 049 979
Accrued expenses	7 548 647	5 093 966
Other advances received*	2 351 892	243
	17 424 222	**10 144 188**

*Includes an amount of R 1.8 million advance received from National Physical Laboratory (NPL) for a collaboration via a visiting fellowship in the field of mass metrology and the technology necessary for the realisation and dissemination of the unit of mass under the revised SI and R 600 000 received from the Department of Science and Technology(Dst) to facilitate the finalisation of the proposal for the establishment of the material characterisation facility.

E.9.10 Revenue

Rendering of services	21 424 280	16 365 433
Other income	112 184	72 742
Interest received	13 194 759	14 444 941
Non-exchange revenue	232 784 000	253 275 802
	267 515 223	**284 158 918**
The amount included in revenue arising from exchange transactions is as follows		
Rendering of services	21 424 280	16 365 433
Other income	112 184	72 742
Interest received	13 194 759	14 444 941
	34 731 223	**30 883 116**
The amount included in revenue arising from non-exchange transactions is as follows:		
Transfer received from controlling entity towards operating expenditure	109 698 000	106 470 000
Transfer received from controlling entity towards capital expenditure	123 086 000	146 333 000
Donations received	-	472 802
	232 784 000	**253 275 802**

E.9.11 Operating expenses

Advertising	3 269 526	2 019 725
Auditor's remuneration	894 247	830 133
Bursaries	1 869 663	1 320 016
Catering, events and meetings*	3 074 810	1 549 534
Chemicals and lab consumables	5 266 239	5 902 427
Conference fees	511 021	437 465
Consulting and professional fees*	119 310	416 934
Electricity	3 134 510	2 894 639
External calibration costs	1 057 093	1 014 569

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018
Health and safety services*	1 182 883	405 013
IT expenses	5 784 496	3 559 772
Insurance	725 786	443 849
International assessors expenses	246 148	283 652
Inventories written-down to net realisable value	86 081	-
Lease rentals on operating lease	12 533 951	11 453 144
Other expenses	1 738 590	1 553 300
PPP project expense*	413 100	1 192 392
Payroll costs* Postage	16 244	509 519
courier Printing and	2 745 168	1 694 243
stationery Recruitment	2 041 967	1 750 659
costs*	99 920	487 311
Research and development costs SANAS	460 800	-
assessment/Quality expenses Staff	782 382	508 801
welfare	155 528	125 606
Subscriptions and membership fees	570 321	663 500
Technical components Telephone and	9 387 650	12 452 710
fax	667 180	719 956
Training Travel -	2 983 959	3 754 153
local Travel -	1 853 025	1 223 009
overseas	6 384 145	5 726 097
	70 055 743	**64 892 128**

***Variances above 50%**

Expenditure on catering, events and meetings increased due to increase in number of events and conferences hosted to increase NMISA's visibility.

Staff training and transfer of skills resulted in planned activities performed internally instead of engaging consultants.

Occupational medical checks services for the past 3 years were only invoiced in the current year by CSIR resulting in a significant increase in expenditure for health and safety services.

Contract ended and function was handled internally for the remainder of the financial year thus resulting in a significant decrease in PPP project expenditure.

Payroll function which was previously outsourced is now performed in-house.

Due to moratorium on new positions and absorption of bursars (workback period) to fill vacant positions due to the company restructure. Recruitment cost decreased significantly.

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.12 Employee related costs

Net earnings	62 021 924	59 818 805
Performance bonuses	15 775 012	13 363 313
Unemployment Insurance Fund (UIF)	552 348	544 913
Third-party payments*	13 824 719	13 171 823
Leave pay provision charge	1 484 319	523 303
Pay As You Earn (PAYE)	25 782 092	19 889 075
Long-service awards	105 958	179 754
Temporary employees	1 511 704	1 681 020
Compensation for occupational disease and injuries	141 806	171 357
Career ladder adjustments	2 493 272	5 210 220
	123 693 155	**114 553 582**

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

E.9.13 Credit losses

Provision for doubtful debts and debts written off	9 866	137 697

E.9.14 Cash generated from operations

Surplus	20 237 489	60 018 894
Adjustments for:	43 220 376	34 718 620
Depreciation and amortisation	1 240 780	(143 675)
Loss/(profit) on disposal of assets	606 286	58 431
Foreign exchange loss	155 051	-
Impairment loss	1 484 319	523 304
Movement in provision for leave	(3 712 963)	4 712 307
Movement in provision for career ladder adjustments	4 441 456	2 383 919
Movement in provision for performance bonuses	670 513	-
Movement in provision for courier services	(9 866)	137 697
Credit losses	(4 890 012)	197 134
Changes in working capital:	(867 378)	(3 127 715)
Inventories	5 099 558	(2 902 485)
Receivables from exchange transactions	6 673 747	(9 088 876)
Pre-payments	(161 249)	(674 492)
Payables from exchange transactions		
Income received in advance	**74 188 107**	**86 813 063**

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.15 Commitments

Already contracted for but not provided for

Capital expenditure	104 771 209	107 303 711
Operating expenditure	43 468 509	27 146 795
	148 239 718	**134 450 506**

The delivery lead times for equipment procured by NMISA can be anything up to a year and in some cases beyond a year. At times, funds are often rolled over annually in the form of commitments, for those awards made for which equipment has not yet been delivered.

NMISA procures specialised equipment (custom made on order or assembled to order according to specification by international manufacturers). Some of the equipment is only used by National Metrology Institutes and the components need to be characterised and tested on assembly. This equipment must be thoroughly tested, verified and calibrated to ensure traceability to International Standards before delivery, since the results generated are used as input into uncertainty of measurement calculations.

Operating leases		
Surplus is stated after the following has been taken into account:		
Operating lease rental expense	12 398 716	10 535 483
Operating lease commitments - Printers		
within one year	47 261	567 133
in second to fifth year inclusive	-	50 157
	47 261	**617 290**
Operating lease commitments - Building		
- within one year	**13 210 816**	**11 176 268**

Significant lease arrangements

Lease rental - Building

The lease relates to the use of buildings for a total period of eight years, commencing on 01 April 2011. The lease was for an initial period of three years, after the expiry of the initial period the lease period was extended by five years to, 31 March 2019. The rental increases on the 01st of April of each consecutive year, the increase will be based on CSIR's annually approved rental rates. The rental is payable monthly in advance.

The operating lease converted to month-to-month on the date of expiry (31 March 2019). The amount disclosed is not a contractual commitment but better represents the reality of future building lease payments for the anticipated renewal.

Lease rental - Printers

The lease relates to the use of Printers for a total period of 36 months, commencing on 01 May 2016. The rental shall be increased annually, by an amount based on the combined effects of currency fluctuations, increase in statutory costs, suppliers price increases and variations in the Consumer Price Index, compounded annually. The rental is payable monthly in arrears.

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.16 Related parties

Relationships

Controlling entity	Department of Trade and Industry
Non-executive Management	Ms Lindie Lankalebalelo (Appointed 1 July 2018) Mr Mololekoa Petrus Mohlomi (Appointed 1 July 2018) Ms Bavelile Hlongwa (Appointed 1 July 2018) Mr Odirile Dingoko (Appointed 1 July 2018) Ms Jabu Mogadime (Term extended from 1 July 2018) Mrs Nobom Gcinashe Mfabana (Appointed 1 July 2018) Ms Ursula Ntsubane (Appointed 1 March 2015) Dr Tshenge Demana (the dti representative) Dr Prinsloo Nevhutalu (Term ended May 2018) Mr Thembani Bukula (Term ended May 2018) Mr Tshokolo Nong (Term ended May 2018) Ms Tshidi Molala (Resigned March 2018) Dr Rudzani Nemutudi (Term ended May 2018) Ms Bongani Mathebula (Resigned January 2018)
External members of the Audit and Risk Committee	Mr Kgosietsile Kgosiemang (Term ended May 2018) Mr Zenzele Gilbert Myeza (Appointed November 2018) Ms Romeshni Govender (Appointed November 2018)

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

External members of the IT Steering Committee	Mr Senzo Dlamini (Appointed 1 November 2013) Mr Sipho Masinga (Appointed 12 June 2017)
Members of key Management	Mr Ndwakhulu Mukhufhi Mr Benjamin van der Merwe Dr Wynand Louw Ms Natasha van der Walt Dr Jayne de Vos Mr Teboho Mthombeni Mr Calvin Sehlapelo Ms Zakithi Msimang
Entities under common control	South African National Accreditation Systems (SANAS) Export Credit Insurance Corporation (ECIC) National Empowerment Fund (NEF) South African Bureau of standards (SABS) National Credit Regular (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 Companies Tribunal (CT)

Key Management information

Class	Description	Number
Non-executive Management	Accounting Authority	8
Executive Committee	Executive Management	8

Figures in Rand

E.9.17 Members' Emoluments

Executive

2019

	Basic salary	Annual bonus	Pension contribution	Performance bonus	Allowances	Other expenses	Total
Mr Teboho Mthombeni	1 174 235	-	97 857	213 646	9 000	768	1 495 506
Mr Ndwakhulu Mukhufhi	2 157 351	36 306	50 234	402 923	12 000	23 573	2 682 387
Ms Zakithi Msimang	1 331 915	54 476	76 748	171 215	9 000	529	1 643 883
Mr Calvin Sehlapelo	1 474 573	-	23 047	135 538	9 000	2 989	1 645 147
Dr Wynand Louw	1 170 602	-	93 914	163 419	112 860	15 709	1 556 504
Ms Natasha van der Walt	1 413 986	-	84 587	259 361	9 000	-	1 766 934
Dr Jayne de Vos	1 389 717	54 180	92 988	226 232	9 000	-	1 772 117
Mr Benjamin van der Merwe	1 477 600	65 364	92 237	133 794	9 000	4 882	1 782 877
	11 589 979	**210 326**	**611 612**	**1 706 128**	**178 860**	**48 450**	**14 345 355**

2018

	Basic salary	Annual bonus	Pension contribution	Performance bonus	Allowances	Other expenses	Total
Mr Tebogo Mthombeni	1 060 225	-	93 171	-	-	6 988	1 160 384
Mr Ndwakhulu Mukhufhi	1 884 299	32 410	45 246	461 959	-	45 157	2 469 071
Ms Zakithi Msimang	966 633	51 636	73 073	164 540	-	115 887	1 371 769
Mr Calvin Sehlapelo (Appointed 5 September 2017)	774 220	-	9 031	-	-	1 984	785 235
Dr Wynand Louw	1 155 186	-	93 901	155 331	103 860	73 455	1 581 733
Ms Natasha Nel-Sakharova	1 025 197	-	80 536	-	-	10 567	1 116 300
Ms Jayne de Vos	949 436	61 937	88 535	81 530	-	11 409	1 192 847
Mr Benjamin van der Merwe	919 156	61 931	87 642	120 542	-	35 372	1 224 643
	8 734 352	**207 914**	**571 135**	**983 902**	**103 860**	**300 819**	**10 901 982**

Figures in Rand	2019	2018
Non-executive management emoluments		
	Fees	**Fees**
Dr Prinsloo Nevhutalu (Term ended May 2018)	6 140	72 347
Mr Thembani Bukula (Term ended May 2018)	3 769	23 316
Mr Tshokolo Nong (Term ended May 2018)	4 586	55 454
Ms Tshidi Molala (Resigned 01 March 2018)	-	43 242
Dr Rudzani Nemutudi (Term ended May 2018)	11 306	63 568
Mr Senzo Dlamini (Appointed 1 November 2013)	14 573	16 080
Mr Sipho Masinga (Appointed 12 June 2017)	17 864	18 561
Mr Kgosietsile Kgosiemang (Term ended May 2018)	12 042	20 858
Ms Jabu Mogadime (Term extended from 1 July 2018)	65 244	54 418
Ms Romeshni Govender (Appointed November 2018)	6 499	-
Dr Cleopas Sanangura (Term ended May 2018)	19 479	56 416
Ms Bongani Mathebula (Resigned January 2018)	-	16 080
Ms Ursula Ntsubane (Appointed 1 March 2015)	56 474	62 907
Ms Bavelile Hlongwa (Appointed 1 July 2018)	42 144	-
Ms Lindie Lankalebalelo (Appointed 1 July 2018)	48 311	-
Mr Odirile Dingoko (Appointed 1 July 2018)	42 680	-
Ms Nobom Mfabana (Appointed 1 July 2018)	46 125	-
Mr Molelekoa Mohlomi (Appointed 1 July 2018)	55 277	-
	452 513	**503 247**

Dr Tshenge Demana (**the dti** representative) does not receive remuneration for the meetings attended.

E.9.18 Risk Management 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 grant received from **the dti**. NMISA maintains liquidity by limiting capital and operational expenditure within the pre-approved budget.

2019	Carrying amount R	1 to 3 months R	6 to 9 months R	10 to 12 months R	2 to 5 years R	More than 5 years R
Trade and other payables	17 424 222	16 843 996	580 226	-	-	-
	17 424 222	**16 843 996**	**580 226**	**-**	**-**	**-**

2018	Carrying amount R	1 to 3 months R	6 to 9 months R	10 to 12 months R	2 to 5 years R	More than 5 years R
Trade and other payables	10 144 188	9 806 298	337 890		-	-
	10 144 188	**9 806 298**	**337 890**	**-**	**-**	**-**

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

Credit risk

Credit risk for NMISA is mainly limited to 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 are derived from revenue earned by, but not limited to, calibrating equipment, materials characterisation, certified reference materials, proficiency testing schemes and primary reference gas mixtures. There is no independent rating and as a result management assesses the credit quality of the customer, taking into account trade references, 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 and individually based on payment history for impairment. The provision for impairment is 2% (2018: 3%) of the total receivables book. The majority of the receivables are from the private sector.

Figures in Rand	2019	2018
The maximum exposure to credit risk is as follows:		
Trade receivables	7 073 812	6 073 539
Less: Provision for impairment of trade receivables	(168 900)	(194 378)
Rental deposits	605 419	605 419
	7 510 331	**6 484 580**

As at 31 March 2019, the age analysis of the receivables from exchange transactions net of provision for impairment of trade receivables, was as follows:

Figures in Rand	2019	2018
Not past due	4 910 386	4 727 197
Past due 1-30 days	974 918	691 949
Past due 31-60 days	25 580	248 627
Past due 61-90 days	72 945	77 419
Past due 90 days and over	921 083	133 969
	6 904 912	**5 879 161**

Cash flow risk

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

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 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.

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

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

Short-term deposits	175 206 933	187 012 174

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. To the extent that the transactions are considered to be material, suppliers are required to provide firm prices to minimise the risk.

E.9.19 Going concern

The AFS 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.

E.9.20 Events after the reporting date

No events after the reporting date were identified by management that would affect the operations of NMISA or the results of those operations significantly.

E.9.21 Contingent liabilities

21.1 An amount of R 26 409 for the performance bonus of the Director (Physical Metrology) who acted as interim CEO for the 2012/13 financial year is still outstanding. The outcome of this matter will be confirmed by the performance evaluation feedback from the Accounting Authority.

Figures in Rand	2019	2018
E.9.22 Fruitless and wasteful expenditure		
Fruitless and wasteful expenditure	-	15 612
Less: Debt raised	-	(15 612)
	-	-
E.9.23 Rental Deposit		
Rental deposit	605 419	605 419

The rental deposit is refundable to the entity at the end of the lease term.

E.9.24 Irregular expenditure

Opening balance	-	18 388
Add: Irregular Expenditure - current year	-	14 763
Less: Amounts condoned	-	(33 151)
	-	-

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

The above irregular expenditure was as a result of non-compliance with SCM processes and regulations.

E.9.25 Retirement benefits

Contribution to pension fund	13 824 719	13 174 175

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.

E.9.26 Material differences between budget and actual amounts

E.9.26.1 Demand for certified reference materials, reference measurements and calibration services was lower than anticipated at the time of budgeting.

E.9.26.2 The favourable variance is due to funds for current year tenders being committed but not yet paid due to delivery having not taken place. This resulted in a higher bank balance than anticipated.

E.9.26.3 Variance of 44% is due to funds being committed but not yet expensed.

E.9.26.4 Variance due to depreciation of the Rand.

E.9.26.5 Depreciation, impairment loss, other income, credit losses and gains/ losses on disposals of assets are not budgeted for as they do not have cash outflow implications.

E.9.26.6 The procurement of tenders planned has been concluded. Although these tenders have not come through into this report, most of the tenders have been awarded, therefore funds are committed but not yet expensed. Expenditure recorded in the actual year to date figures includes payments towards prior year commitments.

E.9.27 Prepayments

Pre-payments - current asset	10 885 044	15 444 445
Pre-payments – non-current asset	169 976	710 133
	11 055 020	**16 154 578**

NMISA procures specialised equipment (custom made on order or assembled to order by International manufacturers according to NMISA specification). Some of the equipment is only used by National Metrology Institutes and the components need to be characterised and tested on assembly. This equipment must be thoroughly tested, verified and calibrated to ensure traceability to International Standards before delivery thus the delivery lead times for equipment procured by NMISA can be anything up to a year and in some cases beyond a year. As a result most of the suppliers require a certain portion of the award amount to be prepaid on placement of an order or on completion of certain stages in the production process.

E.9 Notes to the Financial Statements (continued)

Figures in Rand	2019	2018

E.9.28 Provisions

Reconciliation of provisions - 2019

	Opening Balance	Additions	Utilised during the year	Reversed during the year	Total
Annual leave provision	3 589 961	5 074 280	(262 430)	(3 327 531)	5 074 280
Provision for career ladder adjustments	5 210 220	1 497 257	(5 210 220)	-	1 497 257
Provision for performance bonuses	14 033 919	18 475 375	(11 333 556)	(2 700 363)	18 475 375
Provision for courier services	-	670 513	-	-	670 513
	22 834 100	**25 717 425**	**(16 806 206)**	**(6 027 894)**	**25 717 425**

Accumulated annual leave from the previous leave cycle not taken by 30 September each year is forfeited. The average number of leave days per employee is 8.72 (2018: 8.96).

Reconciliation of provisions - 2018

	Opening Balance	Additions	Utilised during the year	Reversed during the year	Total
Annual leave provision	3 066 657	3 589 692	(265 454)	(2 800 934)	3 589 961
Provision for career ladder adjustments	497 913	5 210 220	(497 913)	-	5 210 220
Provision for performance bonuses	11 650 000	13 256 467	(10 872 548)	-	14 033 919
	15 214 570	**22 056 379**	**(11 635 915)**	**(2 800 934)**	**22 834 100**

Accumulated annual leave from the previous leave cycle not taken by 30 September each year is forfeited. The average number of leave days per employee is 8.96 (2017: 9.24).

NOTES:

NOTES:

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